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ABSTRACT

Twelve major papers delivered during this conference on agricultural education in the northeastern states are included in this volume: (1) "Status of Pennsylvania Special Needs Students in Vocational Agriculture: Phase III--Placement for Training and Employment," by Connie Baggett, Dennis Scanlon, Anthony Mallilo, and Sam Curtis; (2) "Competencies Needed by Full-Time Employees to Enter the Apple Production Industry in Adams County, Pennsylvania," by George Hamilton and James Mortensen; (3) "Teacher Perception: FFA Membership with Non-Enrollment in Vocational Agriculture Courses," by Regina Smick and Ronald Seibel; (4) "The Relationship between Characteristics of Colorado's American Farmer Degree Recipients from 1968 to 1977 and Their Current Occupational Status," by Stacy Gartin; (5) "The Effect of a Floral Merchandising and Design Record Book on Student Achievement," by Joel Simmons and James Mortensen; (6) "Factors Influencing Student Selection of The Pennsylvania State University's College of Agriculture," by Kerry Odell; (7) "The Affective Work Competency Development of Vocational Agriculture Students Involved in SOE Programs in New York State," by Patrice Dugan and Dean Sutphin; (8) "A Comparison of New York BOCES and Central High School Teacher Perceptions, Concerning the Status and Importance of Supervised Occupational Experience Programs," by Dean Sutphin; (9) "An Analysis of Research Methodology Used in Agricultural Education, 1974-1982," by Alfred Mannebach, Paul McKenna, and Geeta Pfau; (10) "Success of Former Vocational Agriculture Students in College of Agriculture Curricula," by Layle Lawrence; (11) "Instructional Status of Agricultural Mechanics Competencies Needed and Possessed by Teachers of Vocational Horticulture in Pennsylvania," by Richard Makin and Richard Stinson; and (12) "Identification and Development of Guidelines, Strategies and Materials to Improve Supervised Occupational Experience Programs in the Northeast," by Arthur Berkey and Dean Sutphin. (KC)

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PROCEEDINGS OF THE RESEARCH CONFERENCE IN AGRICULTURAL EDUCATION

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May 18-19, 1984

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FOREWORD

Research is essential to the growth of Agricultural Education. Through Forums such as the Eastern Regional Agricultural Education Research Conference important issues and problems are analyzed. Similarly, the research process is refined through critiques and discussion of methodology used by researchers. This conference and other scholarly activities in the profession stimulate dialogue and foster further research on critical issues challenging the profession. Appreciation is expressed to the presenters for their thoughtful investigations and hard work.

Hopefully, the papers presented at the 1984 Eastern Regional Conference will prove useful to other scholars. All the presenters are encouraged to publish their work through other appropriate channels so that the profession can make maximum use of the research. Now is the time to start preparing for the 1985 Eastern Regional Research Conference. Perhaps, some ideas shared during this conference will lead to research which can be shared next year.

A special thanks is extended to Conference session chairmen, discussants, recorders and presenters. Appreciation is expressed to Agricultural Educators from Massachusetts who have served as gracious hosts. Finally, the leaders of the Eastern Region Supervisors and teacher educator professional associations are commended for their leadership in organizing regional activities which contributed to the success of this research conference.

Dean Sutphin
Co-chairman, Research Seminar

Dennis Scanlon
Co-chairman, Research Seminar

Eastern Region Agricultural Education
Research Conference

Concurrent Session A

Theme: Student Development and Placement

Chairman: Dennis Scanlon

Recorder: Joy Cantrell

Discussants: Ron Siebel
Jim Mortensen

Status of Pennsylvania Special Needs Students in Vocational Agriculture: Phase III-- Placement for Training and Employment	Connie Baggett Dennis Scanlon Anthony Mallilo Sam Curtis Penn State University
Competencies Needed by Full-Time Employees to Enter the Apple Production Industry	George W. Hamilton, Teacher Biglerville High School James Mortensen Penn State University
A National Study of FFA Membership with Non-Enrollment in Vocational Agriculture Courses	Regina Smick Ronald Seibel University of Maryland
The Relationship Between Characteristics of Colorado's American Farmer Degree Recipients from 1968 to 1977 and their Current Occupational Status	Stacy Gartin West Virginia University

Eastern Region Agricultural Education

Research Conference

Concurrent Session B

Theme: Occupational Experience Programs

Chairman: Elmer Cooper

Recorder: Martin Mitchell

Discussants: Art Berkey
Tony Mallilo

The Effect of a Floral Merchandising and Design Record Book on Student Achievement	Joel Simmons Assistant Extension Agent Nazareth, PA James Mortensen Penn State University
Factors Influencing Student Selection of The Pennsylvania State University's College of Agriculture	Kerry Odell Penn State University
The Affective Work Competency Development of Vocational Agriculture Students Involved in SOE Programs in New York State	Patrice Dugan Extension Agent Auburn, NY Dean Sutphin Cornell University
A Comparison of New York BOCES and Central High School Teacher Perceptions, Concerning the Status and Importance of Supervised Occupational Experience Programs	Dean Sutphin Cornell University

Eastern Region Agricultural Education
Research Conference

Session C

Theme: Teacher Training in Agricultural Education

Chairman: Dean Sutphin

Recorder: Stacy Gartin

Discussants: Dave Howell
Ed Yoder

An Analysis of Research Methodology Used in Agricultural Education, 1974-1982	Alfred Mannebach University of Connecticut
Success of Former Vocational Agriculture Students in College of Agriculture Curricula	Layle Lawrence West Virginia University
Instructional Status of Agricultural Mechanics Competencies Needed and Possessed by Teachers of Vocational Horticulture in Pennsylvania	Richard Makin Ohio State University Richard Stinson Ohio State University
Guidelines, Implementation Strategies and Resource Material for SOEP in the Northeastern United States	Arthur Berkey Dean Sutphin Cornell University

STATUS OF PENNSYLVANIA SPECIAL NEEDS STUDENTS IN VOCATIONAL AGRICULTURE: PHASE III -- PLACEMENT FOR TRAINING AND EMPLOYMENT

(Agricultural Experiment Project Number 2484)

a

paper

presented

at

The Eastern Regional Agricultural Educational Conference and Research Seminar

of

NVATA-NASAE-AATEA at Sturbridge, Massachusetts

May 18-19, 1984

by

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STATUS OF PENNSYLVANIA SPECIAL NEEDS STUDENTS IN VOCATIONAL AGRICULTURE: PHASE III--PLACEMENT FOR TRAINING AND EMPLOYMENT

Introduction

It was not until the passage of Public Law 94-142 that proper attention was given to the education of our handicapped population. According to Cartwright, Cartwright, and Ward (1981), efforts to focus proper attention on the handicapped population occured as far back as 1843 with Dorothea L. Dix. Through her efforts and those efforts of her followers, proper and needed attention has improved the situation of handicapped persons.

In 1975, Congress passed into law the Education of All Handicapped Children Act (P.L. 94-142). This Act mandated that all physically, mentally, and emotionally handicapped children be provided with the opportunity to receive a free, appropriate public education (Simonson, 1980, p. 1). This Act was reinforced and expanded with the passage of the Education Amendment of 1976 (P.L. 94-482). In addition to the aforemention legislation, the Vocational Rehabilitation Act of 1973, Section 503 and 504 guaranteed that all handicapped persons shall have equal access to all programs, jobs, and housing (Cartwright, Cartwright, and Ward, 1981, p. 3). Thusly, teachers were legally bound by law to open their facilities and programs to the handicapped.

Theoretical Background--Placement for Training and Employment

The capstone for many vocational programs is the placement of students in industry so they may sharpen skills learned in the school setting. As a result, most students have an opportunity not only to hone these skills but also to

learn new skills closely aligned with those skills needed to obtain, maintain, and progress in the world of work. Mason and Haines (1965) discussed several placement programs that should be a part of the vocational program. They state that "the occupational experience is expected to be the source for gaining knowledges as well as a vehicle for applying and testing what has been learned in school" (p. 51). When Mason and Haines referred to occupational education for special needs students, they emphasized that the "program is used as a transitional bridge to the adult world for students" (p. 67).

Before special needs students are placed in positions for work experience they must be successful in the program of instruction in the school setting. There is much debate as to the effectiveness of educational approaches in helping special needs students gain as much knowledge as possible before being placed on the job. Finn and Resnick (1984) believe that "our pass preoccupation with the setting in which instruction happens has probably been misplaced" (p. 9). They feel that the "instructional processes that are most effective need to be identified instead" (p. 9). Much research about the instructional setting has taken place but the findings are ambiguous and inconclusive according to Messick (1984). Many special education students do need individual instruction to be successful.

Labeling students into the different categories (EMR, SED, LEP) has had adverse affects on the expectation of these students. Generally, there is a widespread feeling that these students have a low capacity to learn and there is a reduced curriculum with little cognitive demand of special needs students (Finn and Resnick, 1984). The job market, on the other hand, expects each employee to be equally productive and special needs students are no exception. To insure that special needs students learn the greatest amount of information, Finn and Resnick identified several instructional program strategies that may be used. They are programs in which:

1. The teacher provides daily work assignments and thus determines the pace of work,
2. There is regular recording and reviewing of each child's program based on tests directly related to the curriculum content,
3. Systematic reward for good behavior and learning is offered, and
4. A significant amount of one-on-one instruction, sometimes by peer tutors, is given (p. 10).

The ultimate goal of educating special needs students is to help them become self-sufficient. This translates into program graduates "holding a job for which one has or can obtain the necessary skills and for which one is sufficiently reinforced; that is, job match and job satisfaction" (Larsen and Poplin, 1980, p. 115). Placement of special needs students in positions in the work world helps to accomplish this goal, be it for training or employment. There are students classified as special needs students who need "training to work in an institutional or sheltered workshop setting, and there are handicapped students who become competent professionals within various occupation circles" (p. 11).

Previous Research Completed on the Project

In the summer of 1980, the Department of Agricultural and Extension Education, in cooperation with the Agricultural Experiment Station, initiated a comprehensive four-year study to determine the status of Pennsylvania special needs students in vocational agriculture. The project was divided into four parts, corresponding to the four years and completing one of the four objectives each year. In Phase I of the study the researchers, Ma lilo, Baggett, and Curtis (1983), reported that there are a significant number of handicapped students enrolled in vocational agriculture in Pennsylvania. With this number of special needs students mainstreamed into the regular classroom, several problems emerged through data collected from vocational agriculture teachers.

Among these problems are large class sizes, lack of teacher preparation in special needs education, and lack of teaching materials suitable for use with special needs students. These results were similar to those reported by Manzitti, Boratynski, and Rader (1976).

Phase II of this study concentrated on the curriculum and educational facilities in which handicapped students in vocational agriculture find themselves. This phase was conducted in 1982 (Mallilo, Baggett, and Curtis). Surprisingly, over 96 percent of the vocational agriculture programs in Pennsylvania have not developed or purchased curriculum materials or altered instructional methods to accommodate the special needs students enrolled in those programs. Facilities, on the other hand, were generally in good shape to accommodate the handicapped students. Ramps and doorways allowed for easy access by these students as reported by buildings' principals. However, the modification of shop equipment was almost nonexistant. This incident of the lack of modification occurred in light of widespread dissemination of the findings reported by Bruwelheide (1979). Bruwelheide made detail drawings of equipment modification and adaptations to facilitate their use by handicapped students. Much work is still needed in this area.

Objectives of Phase III

The thrust of Phase III of this project sought to determine the activities, type of jobs, and programs relativeness of jobs in which students were placed both for training and employment. Specifically, the following objective was used:

> To enumerate and evaluate the placement of special needs students for cooperative educational experiences.

The objective was modified to include placement for employment to bridge the objective for Phase IV: Follow-up of students placed for employment.

Additionally, data were collected from programs in other vocational areas other than vocational agriculture to facilitate the comparison of efforts between vocational agriculture and those areas.

Methods and Source of Data

Descriptive research, using the survey technique, was used in this study. Survey items used were generated from the department staff and other studies similar to this one (Baggett, Yoder, and Stinson, 1982). These items included the number of students placed in positions for training as well as for employment. The types of employment areas--i.e., agricultural production, food service, and general sales--were also used to gather information. The last section of the survey instrument dealt with methods of locating and placing students into these positions.

Once the survey instrument was completed and approved by the members of the research tear, it was printed and coded for distribution. The instrument was distributed to schools with vocational agriculture programs and to schools without vocational agriculture but with other vocational programs. These schools were selected through a stratified random sample based upon the percentage of the school's population that were categorized as special needs. Consequently, the state was divided into three sections, the percentage of special needs students were calculated, and the sample was drawn based upon the proportion of special needs students in each of the three sections of the state. The eastern region had a high percentage of handicapped students and a higher number of schools were selected from that region. After the sample was drawn, 12 percent of these identified schools were randomly selected for personal visitation to collect the data. It was felt that the school's director of pupil services, guidance counselors, and cooperative education coordinators were best suited to complete the instrument. The initial mailings were completed by

December 22, 1982. The visitations were completed by January 25, 1983. Out of the 83 schools contacted, 55 responsed (66 percent return).

Findings

In the spring of 1983 it was reported that Pennsylvania has a sizeable amount of handicapped students in the vocational agriculture student population (Mallilo, Baggett, Curtis, 1983). This handicapped population included students in each of the categories identified in the legislation. For convenience, this data has been lifted from that report and identified as Table 1. As shown, the majority of the handicapped population are categorized as either learning disabled or educable mentally retarded (48.9 and 23.2 percents, respectively). Because of these percentages, it was felt that additional study was appropriate and in order. The following findings will provide added information about this special needs population.

Table 1

Number of Handicapped Students Enrolled in Pennsylvania Vocational Agriculture Programs According to Handicap

Handicap	No. of Handicapped Students	Percent
Learning Disabled	380	48.9
Educable Mentally Retarded	180	23.2
Visually Handicapped	56	7.2
Emotionally Disturbed	50	6.4
Physical or Health Impaired	48	6.2
Speech Impaired	32	4.1
Deaf	31	4.0
TOTAL	777	100.0

Information was gathered from both the area vocational technical schools and the comprehensive high schools. The data in Table 2 summarize this information. As can be seen, students were placed in an assortment of jobs

ranging from food service to jobs in industry. The food service industry had the highest number of special needs students. This category includes the typical fast food industry. General industry also had a high number of these students, 27.2 percent of all placed for work experience. In this study, other agriculture indicates an area not specified by respondents.

Table 2

Total Number and Percent of Special Needs Students Placed for Work Experience in General Occupational Areas as Reported by AVTS and Comprehensive High Schools

Occupational Categories	Number of Students	Percent of Students
Other Agriculture	73	12.4
Food Service	203	34.5
Sales	67	11.4
Gas Station Attendant	22	3.7
Industry	160	27.2
Other Employment	63	10.7
TOTAL	588	100.0

As one examines the data on how students were placed in agricultural occupational areas, it is apparent that horticulture seems to dominate as the area in which most handicapped students are placed. Out of the 168 students placed in the agricultural areas, 76 (45.2 percent) were placed in the horticultural industry. This was very surprising when the majority of vocational agriculture programs in Pennsylvania are agricultural production or agricultural mechanics. Yet, agricultural production and mechanics only accounted for 14.8 percent, each, as areas in which students are placed for employment. An area that did have a respectable placement of students in the agricultural products occupational area. This area tallied 17.3 percent of all special needs students in agricultural occupations. This data is presented in Table 3.

Table 3

Total Number and Percent of Agricultural Special Needs Students Placed for Training in the Agricultural Occupational Areas as Reported by Secondary Schools with Vocational Agriculture Programs

Employment Areas	Number of Students	Percent of Students
Agricultural Production	25	14.8
Agricultural Products	29	17.3
Agricultural Supplies and Services	7	4.2
Horticulture	76	45.2
Agricultural Mechanics	25	14.8
Forestry	2	1.2
Agricultural Resources	4	2.4
TOTAL	168	100.0

Table 4 presents some interesting findings relative to special needs students in the different categories as defined by Public Law 94-142. This table deals only with non-agricultural students. As expected, educable mentally retarded students accounted for the largest number placed for employment of the 542 special needs students. This category encompassed 36.3 percent of these students. The learning disabled student category had a similarly high number of students with 32.1 percent. Schools reported a very small number of visually handicapped and deaf students being placed for employment. Generally, these two categories are of a minority in the public school system. Many students with this handicapping condition are attending specialized schools.

Table 4

Total Number and Percent of Special Needs by Handicapping Conditions Placed for Employment as Reported by Schools Without Vocational Agricultural Programs

Handicapping Categories	Number of Students	Percent of Students
Learning Disabled	174	32.1
Educable Mentally Retarded	197	36.3
Visually Handicapped	5	.9
Emotionally Disturbed	106	19.6
Physically Impaired	42	7.7
Speech Impaired	13	2.4
Deaf	5	.9
TOTAL	542	100.0

There were striking differences between schools with vocational agriculture and those without vocational agriculture in the placement for employment by handicapping conditions. When comparing the data from Table 4 with that in Table 5, the latter indicated a higher percent of students in the learning disabled category. The learning disabled students accounted for 50 percent of all students placed for employment from the schools with agricultural programs. Educable mentally retarded students totaled only 42 or 19.4 percent of all students placed. When these two categories are compared with the total number of special needs students enrolled in the vocational agriculture in these same categories, they only account for 28.68 and 23.33 percents, respectively. All of the other categories have relatively low percentages in comparison.

Table 5

Comparison of Special Needs Students by Category, Number Placed for Employment, and by Number Enrolled in Vocational Agriculture Programs

Handicapped Category	Number of Students Placed	Percent of Students Placed	Total Number of Students Enrolled	Percent of Enrolled Students Placed
Learning Disabled	109	50.0	380	28.68
Educable Mentally Retarded	42	19.4	180	23.33
Visually Handicapped	1	.5	56	1.80
Emotionally Disturbed	10	4.6	50	20.00
Physically Impaired	22	10.0	48	45.83
Speech Impaired	21	9.7	32	65.60
Deaf	12	5.2	41	38.71
TOTAL	217	100.0	777	27.93

The data denoting the efforts of vocational agriculture placing special needs students for training was not much different than that for employment. Generally, there were a small percentage of special needs students placed for training when compared with the total number available for placement. In the learning disabled category, only 25.8 percent of the students were placed even though this category accounted for 42 percent of the total special needs students placed. A relatively high percent of the educable mentally retarded students were placed for training (42.22 percent). It was very interesting to see that emotionally disturbed and deaf students had a relatively high percent placement for training (40 and 34.15 percents, respectively) in comparison with their number available for placement (see Table 6).

Table 6

Number and Percent by Category of Special Needs Students in Agriculture Placed for Training

Handicapped Category	Number of Students Placed	Percent of Students Placed	Total Number of Students Enrolled	Percent of Enrolled Students Placed
Learning Disabled	98	42.0	380	25.80
Educable Mentally Retarded	76	33.0	180	42.22
Visually Handicapped	1	.4	56	1.80
Emotionally Disturbed	20	9.0	50	40.00
Physically Impaired	10	4.5	48	20.83
Speech Impaired	10	4.5	32	31.25
Deaf	14	6.0	41	34.15
TOTAL	229	100.0	777	29.47

Enrollment data were not collected for special needs students in the other vocational areas. However, placement data were collected. Generally, agriculture special needs students were placed for training at a higher incidence than their counterparts in the other vocational areas. The comparison, however, is only based upon the percentage by handicapping categories. Table 7 reports this data. The learning disabled category had a total of 300 students placed for training and this total accounts for 34.3 percent of all special needs students placed. Educable mentally retarded students also had a high percentage of students placed. When compared with agricultural special needs students in the same handicapping category, one can see (Table 6) that these categories differ very little from each other. The agricultural programs did slightly better with the learning disabled and the other vocational areas did slightly better with educable mentally retarded.

Table 7

Number and Percent by Category of Vocational Special Needs Students in Non-Agricultural Jobs Placed for Training

Handicapped Category	Number of Students	Percent of Placed Students
Learning Disabled	300	34.3
Educable Mentally Retarded	364	41.6
Visually Handicapped	12	1.4
Emotionally Disturbed	142	16.2
Physically Impaired	35	4.0
Speech Impaired	12	1.4
Deaf	10	1.1
TOTAL	875	100.0

As the data indicates, special needs students are being placed for training as well as for employment. Another concern of this project was to determine what methods were used in placing students. Respondents were asked to identify the methods or techniques used for placement. These different methods are reported in Table 8 on the following page.

Table 8

Methods by Types of Jobs in Placing
Special Needs Students

Methods	Number of Students Placed						
	Other Agri-culture	Food Service	Sales	Gas Station	Industry	Other Jobs	TOTAL
List of Employers							
Yes	73	137	58	18	159	51	493*
No	0	66	9	4	1	12	95*
School Placement							
Yes	73	197	63	20	155	53	561*
No	0	6	4	2	5	10	27*
Employment Security Commission							
Yes	73	98	35	14	126	52	398*
No	0	105	32	8	34	11	190*
CETA							
Yes	0	9	3	0	42	12	66*
No	73	194	64	22	118	51	522*
Sheltered Workshop							
Yes	8	12	3	0	57	19	99*
No	65	191	64	22	103	44	489*
TOTAL	73	203	67	22	160	63	588*

*Due to the nature in which the data were collected, these numbers of students may also appear in each of the methods for placing students.

From the data in Table 8, one can see that the schools' placement efforts appear to be more effective than maintaining a list of employers or usage of Employment Security Commission. However, it is difficult to determine the best method since schools used a combination of all methods. Consequently, students were reported as being placed under all of these methods. An examination of the data only gives clues toward the most effective method.

Another area of major importance to vocational agriculture is a comparison between comprehensive high schools and area vocational technical schools in

placing special needs students for training or employment. Placement data were analyzed relative to the two types of schools both with and without vocational agriculture. Table 9 shows the data for students placed in positions as reported by vocational programs other than vocational agriculture. The data indicates that students were placed in agriculture positions although schools were not identified as having an agricultural program.

Table 9

Placement of Special Needs Students in Jobs by
Type of School With and Without Vocational Agriculture

	Employment Areas						
Types of Schools	Other Agri-culture	Food Service	Sales	Gas Station	Industry	Other Areas	TOTAL
AVTS							
With Agriculture							
Number	8	162	57	10	101	31	367
Percent Col	10.9	78.8	85.1	45.5	63.1	49.	4
Without Agriculture							
Number	0	9	0	3	0	24	36
Percent Col	0	4.4	0	13.6	0	38.1	6.1
HIGH SCHOOL							
With Agriculture							
Number	0	12	3	1	19	2	37
Percent Col	0	5.9	4.5	4.5	11.9	3.2	6.3
Without Agriculture							
Number	65	22	7	8	40	6	148
Percent Col	89.1	10.8	10.4	36.3	25.0	9.5	25.2
TOTAL							
Number	73	203	67	22	160	63	588
Percent Col	12.41	34.52	11.39	3.74	27.21	10.71	

There were many more students placed through the area vocational technical schools as compared with the high schools. A little more than 400 students were placed by the area vocational technical schools compared with less than 200 students in the high schools. Also, high schools without vocational

agricultural programs placed a sizeable number of students in agricultural occupations as compared with the area vocational technical schools.

Table 10 shows the placement of students in the taxonomy areas of vocational agriculture. Unsurprisingly, a large number of special needs students are placed in horticultural jobs. On the other hand, however, the placement of these students in the agricultural products area is surprising. Generaly, this are has not received a lot of attention as a viable area of program concentration and development.

Table 10

Placement of Special Needs Students in Agricultural Occupations Based on the Type of School and Whether the School Had an Agricultural Program

Type of School	Ag Production	Ag Products	Ag Supplies and Services	Hort	Ag Mech	Forestry	Ag Res	TOTAL
AVTS								
With Agriculture								
Number	16	30	7	56	21	1	4	135
Percent Col	53.33	83.33	63.64	88.5	37.5	100	100	79.9
Without Agriculture								
Number	[illegible]	0	1	1	1	0	0	2
Percent Col	0	0	9.09	1.59	0	0	0	1.18
HIGH SCHOOL								
With Agriculture								
Number	10	4	2	2	1	0	0	19
Percent Col	33.33	11.11	18.18	3.17	4.17	0	0	11.24
Without Agriculture								
Number	4	2	1	4	2	0	[illegible]	13
Percent Col	13.33	2.56	9.09	6.35	8.33	0	0	7.69
TOTAL								
Number	30	36	11	63	24	1	4	169
Percent Col	17.75	21.30	6.51	37.28	14.20	.59	2.37	

Summary and Conclusions

As one reviews the findings, very little conclusions can be drawn based upon the data. Generally, there seems to be little differences between the area vocational technical schools and the comprehensive high schools in the placement of special needs students. The AVTS are placing a disproportionate number of students in the food service area and the high schools are not doing much better. There seems to also be a disproportionately large number of special needs students placed in horticultural jobs as reported by schools with vocational agriculture programs.

When the vocational agriculture placement efforts were compared with the other vocational program areas, little differences were also noted. In terms of the placing students with particular handicapping conditions, both programs seem to favor the learning disabled and educable mentally retarded students. A factor in this is probably the high numbers represented in the special needs population identified through this study. Nonetheless, the vocational agriculture programs placed a higher percent of learning disabled students and the other vocational programs placed a high percent of educable mentally retarded students.

The methods and techniques used to place students identified an area that deserves special notation. The school placement activities appeared to be very vigorous. This activity, when compared with the other methods, showed a surprisingly large number of students being placed. However, most schools used a combination of efforts so that all of the credit cannot be attributed solely to this one method. Future designs for this type of study should incorporate this factor for closer scrutiny.

Throughout the conduct of this study, there seemed to be a problem with record keeping at the school level. Many schools simply did not keep accurate records. Occasionally the schools did not know who were handicapped among the

school's special needs population. Some schools even indicated that once a student was mainstreamed into the regular classroom that individual was no longer a special needs student. On the other hand, many schools were reluctant to provide information because of the confidentiality of the students. Also, many schools did not want their regular vocational teacher to know who was handicapped because the teacher may have less expectation from the students and would not encourage the students to perform at the higher level. Many of the returned questionnaires had much missing data, probably because of poor record keeping at the local levels.

Recommendations

The study definitely needs to be replicated in hopes of obtaining better information. The record keeping at the local level needs intense and professional attention. In an age of modern technologies, it is disappointing that little or no records are maintained and updated on the special needs population of the education system. The federal, state, and local government agencies provide millions of dollars each year for the sole purpose of insuring that special needs students have access to programs and facilities along with special assistance to assure the students' success. Only a small majority of schools appear to be abiding by the letter of the law and a minute minority of schools appear to be abiding by the intent of the law (P.L. 94-142).

According to the comments from several counselors, there still exists a pre-Dorothea Dix attitude about special needs students. An intense educational program is recommended to help change these attitudes. Likewise, the attitude that special needs students permanently overcome their handicapping condition needs enlightenment. The ineptitude of some individuals about special needs students is unfortunate for educated people.

Educational Importance

If nothing else is gained from this study, it definitely identifies the need for maintaining more accurate records at the local levels in our public educational system. Superintendents, high school principals, vocational directors of area vocational schools, directors of pupil services, guidance counselors, and special needs directors at the intermediate units need to be involved in a concerted effort to increase the accuracy of records for special needs students. This is probably an effort that needs to be directed by the state educational agency.

Attitudes among responsible school personnel in the secondary educational system indicated that a lot of work needs to be done in this area. When these attitudes are vocalized to colleagues in the school system, one can only shudder at the thought of undoing all that have been accomplished through federal legislation. This attitude seems to dictate a need for inservice education covering issues mandated in P.L. 94-142.

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COMPETENCIES NEEDED BY FULL-TIME EMPLOYEES TO ENTER THE APPLE PRODUCTION INDUSTRY IN ADAMS COUNTY, PENNSYLVANIA

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INTRODUCTION

The content of an agriculture program should be developed around the technical competencies and skills needed by workers in the employment areas of the secondary school. Therefore, a high school vocational agriculture program in an apple producing area should be teaching technical competencies needed by employees entering the apple producing industry. McClay (1978) identified and validated essential agriculture competencies needed for entry and advancement in major agriculture and agribusiness occupations. In his study, McClay identified and validated essential skills needed for the tree fruit grower in general. In order for a teacher to use McClay's list of competencies for teaching apple production, the teacher needs to expand the list of competencies and validate them with local apple producers.

Pennsylvania ranks fourth in apple production in the United States; Adams County is the leading apple producing county in Pennsylvania with 45.5 percent of the state production in 1980 (PA Department of Agriculture, 1981:67). Therefore, the incorporation of apple production competencies in the local vocational agriculture program is justified from an economic aspect. Preparing students for careers in apple production reflects the career opportunities available to Adams County graduates.

Currently there is no validated list of apple production competencies for Pennsylvania. There is a recent list of competencies for the orchardist (Mercer, 1981) that includes some general competencies for apple production. However, Mercer's study does not address the specific competency areas in apple production needed by personnel in the industry. This study provides a detailed listing of technical competencies that may be included in any course of study dealing with apple production. It will be of particular importance in the apple producing areas of Pennsylvania and the United States.

With the apple producers rating the competencies needed by entry level employees, the results can be used to identify a core of essential competencies in apple production. Instructors teaching apple production can base their instruction and instructional materials on the ranked competencies. This identification of a core of competencies is especially important if time allotted for teaching apple production is limited.

Operational Definitions

Competency--The successful performance of a task(s) through the application of behavioral characteristics of knowledge, skills, attitudes, and judgement generally required for the total attitudes, knowledge, and skills which enable one to perform a given function efficiently (modified from McClay's definition, 1978:7).

Small Size Apple Grower--Apple grower having at least 500 producing trees but less than 40 acres of producing apple orchard.

Medium Size Apple Grower--Apple grower having 40-150 acres of producing apple orchard.

Large Size Apple Grower--Apple grower or company having over 150 acres of producing apple orchard.

Fresh Market Apple Grower--Apple grower that markets more than 50% of the crop through fresh market outlets.

Processing Market Apple Grower--Apple grower that markets more than 70% of the crop through processing outlets.

Apple Grower with a Combination of Market Outlets (Fresh and Processing Markets)--Apple grower that markets 50-70% of the crop to processing markets and 30-50% of the apples to fresh market outlets.

OBJECTIVES

The purpose of this study was to identify the competencies needed by full-time employees entering the apple production industry. More specifically, the objectives were:

1. To develop and validate a competency list for full-time employees entering the apple production industry.
2. To identify differences among competency areas needed for full-time employees working for large, medium, and small growers based on acreage.
3. To identify differences among competency areas needed for full-time employees working for growers with fresh market, processing market, or a combination of marketing outlets.

METHODS

The study for the design was a descriptive survey. As such, it did not have an experimental design.

Population

The population for the study consisted of all apple producers in Adams County, Pennsylvania. The names and addresses were obtained from the updated list for the 1978 Apple Referendum, and thus the population is limited to individuals identified on that list. A complete census of the population was taken. The 1978 Apple Referendum list has 123 apple producers. Upon review of the list and collection of the survey instrument, nine producers were inaccessible due to selling of their operation to another established operator, death of the individual, or removal of the apple orchard. Therefore, the accessible population for the study was 114 apple producers in Adams County, Pennsylvania.

Instrumentation

An instrument was developed to obtain basic background information regarding respondents' operation and the ratings for the technical apple production competencies. The respondents were asked to rate the competencies using the following scale: 5=absolutely essential, 4=requiring

above average competence, 3=requiring average competence, 2=requiring little competence, and 1=requiring no competence.

The competencies were obtained from the McClay (1978) study, and from the V-TECS Orchardist study by Mercer (1981). The investigator then revised the list of competencies and the list was reviewed by five apple producers and five vocational agriculture teachers who had taught apple production, in order to establish a face validity. The final instrument contained 210 competency statements in 21 categories.

Data Collection

The survey instrument was mailed to all Adams County apple growers with a cover letter and self-addressed, stamped envelope for its return. One month later a follow-up letter and survey instrument were mailed to non-respondents. Approximately two months after the second mailing, a random sampling of non-respondents (9, 17.9%) was selected and interviewed. The results of follow-up interviews of non-respondents were compared with the mail survey results. A t-test was used to test data. No significant differences were found for 20 of the 21 competency areas. A difference was found between the mail survey group and the interview group for the area "spraying." Results from the mail survey and personal interview survey were combined for analysis. Generalizations were made cautiously for the area of spraying. Table 1 illustrates the scope of the study. Seventy-one usable responses were obtained.

Table 1. Scope of Study.

	Number	Percent
Usable Responses		62.3
Mail Survey	62	
Interview	9	
Non-usable Responses		0.9
Mail Survey	1	
Non-Respondents	42	36.8
Total	114	100.0

Statistical Analysis

Information from completed survey forms was transferred to data process cards for analysis. Data were analyzed using the ANOVES and SPSS canned computer programs. A t-test was conducted on each competency area which compared the mailed and interviewed growers' responses. Analysis of variance was used to test for differences in means among the subgroups. Scheffe's post hoc analysis test was used to examine where differences occurred. Basic descriptive statistics of means, frequencies and standard deviations were also utilized. Multiple choice distribution analysis was used to calculate the mean and standard deviation for each individual competency statement.

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RESULTS

Hypothesis 1--Large apple growers will rate the importance level of the competencies higher than will small or medium sized growers--was rejected for all 21 competency areas. Analysis of variance was used to test the data. For those competency areas showing significant difference, the Scheffe test was run to determine which grower group scores were significantly different.

The mean scores of the three groups of growers and grand mean are shown in Table 2. Only three of the 21 competency areas were rated significantly different. A fourth area, "pollination and fruit set," was found to be significantly different by ANOVA. However, no significant difference was found between or among the groups when the data were analyzed with the Scheffe test. Where significant differences existed the smaller operators rated the competencies higher than the other two groups. Stated positively, the three groups of growers were in agreement regarding the level of importance for 18 of the 21 competency areas.

Table 2. Growers' Perceptions of Competence for Entry Level Employment by Farming Operation Size. (N=71)

Competence Area	Grand $\bar{X}$	s	Small (n=25)		Medium (n=30)		Large (n=15)	
			Rank $\bar{X}$	s	Rank $\bar{X}$	s	Rank $\bar{X}$	s
Develop good work habits and attitudes	3.99	0.98	(6) 3.84	1.28	(2) 3.91	0.72	(1) 4.41	0.65
Farm power and equipment	3.99	0.66	(2) 3.97	0.72	(1) 3.92	0.64	(2) 4.18	0.56
Controlling disease	3.86	0.73	(1) 3.99	0.84	(3) 3.89	0.62	(7) 3.38	0.71
Spraying	3.85	0.71	(3) 3.93	0.83	(4) 3.79	0.66	(3) 3.83	0.63
Controlling weeds	3.81	0.78	(7) 3.84	0.86	(5) 3.77	0.80	(4) 3.81	0.65
Controlling insects	3.73	0.78	(5) 3.87	0.84	(6) 3.71	0.73	(9T) 3.53	0.76
Pruning and training	3.71	0.71	(8) 3.76	0.83	(7) 3.63	0.68	(5) 3.75	0.58
Fumigation	3.63	0.93	(4) 3.87	0.92	(9) 3.43	1.07	(6) 3.60	0.51
Harvesting and storage	3.50	0.63	(12T) 3.69	0.71	(12) 3.32	0.63	(9T) 3.53	0.34
Vertebrate control	3.49	0.76	(10) 3.69	0.78	(13) 3.28	0.78	(8) 3.55	0.69
Fertilization	3.46	0.86	(15) 3.55	0.92	(8) 3.45	0.91	(12) 3.30	0.68
Pollination and fruit set	3.42	0.67	(12T) 3.69*A	0.78	(14) 3.27*A	0.61	(13) 3.26*A	0.43
Field planting	3.40	0.77	(16) 3.51	0.76	(10) 3.36	0.84	(11) 3.31	0.67
Construction and maintenance of needed facilities	3.33	1.04	(14) 3.69*A	1.15	(15) 3.22*AB	0.96	(19) 2.95*B	0.93
Management	3.31	1.10	(18) 3.46	1.11	(11) 3.32	1.03	(18) 3.01	1.19
Marketing	3.29	0.94	(9) 3.72*A	0.84	(18) 3.02*B	0.92	(15) 3.06*AB	0.90
Selection of variety	3.22	1.22	(19) 3.45	1.23	(16) 3.13	1.18	(17) 3.01	1.30
Selection and preparation of site	3.17	0.81	(17) 3.46	0.76	(19) 2.98	0.76	(14) 3.07	0.90
Selection of rootstock	3.14	1.23	(20) 3.31	1.15	(17) 3.05	1.20	(16) 3.03	1.45
Propagation	3.01	1.33	(11) 3.69*A	1.32	(21) 2.72*AB	1.20	(21) 2.44*B	1.21
Irrigation	2.98	0.97	(21) 3.14	1.13	(20) 2.88	0.97	(20) 2.94	0.65

*$p < .05$ by analysis of variance. Means followed by the same letters are not significantly different from each other by the Scheffe test.

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Hypothesis 2--Producers with fresh market outlets will rate the importance level of the competencies higher than will producers with processing outlets--was rejected for all 21 competency areas. The three groups of producers were in agreement on their ratings of 20 of 21 competency areas as indicated in Table 3. One competency showing a significant difference, "controlling weeds," was analyzed using the Scheffe test to determine which operators were significantly different. Producers with fresh market outlets rated this competency area lower than producers with processing market outlets and producers with combination (fresh and processing) market outlets.

Table 3. Growers' Perceptions of Competence for Entry Level Employment by Principal Market Outlet. (N=71)

Competence Area	Grand $\bar{X}$	s	Fresh Market (n=7)		Processing Market (n=47)		Combination (n=17)	
			Rank $\bar{X}$	s	Rank $\bar{X}$	s	Rank $\bar{X}$	s
Develop good work habits and attitudes	3.99	0.98	(4) 3.56	0.86	(1) 3.95	1.03	(2) 4.29	0.81
Farm power and equipment	3.99	0.66	(1) 3.74	0.58	(2) 3.91	0.67	(1) 4.31	0.55
Controlling disease	3.86	0.73	(2) 3.71	0.62	(3) 3.90	0.78	(6) 3.80	0.67
Spraying	3.85	1.03	(7T) 3.49	1.11	(4) 3.86	1.03	(4) 3.97	0.92
Controlling weeds	3.81	0.78	(17) 3.14*A	0.95	(5) 3.83*AB	0.75	(3) 4.01*B	0.68
Controlling insects	3.73	0.78	(3) 3.60	0.51	(6) 3.77	0.80	(9) 3.69	0.85
Pruning and training	3.71	0.71	(5) 3.54	0.45	(8) 3.64	0.78	(5) 3.95	0.55
Fumigation	3.63	0.93	(21) 3.01	1.30	(7) 3.66	0.93	(7) 3.79	0.70
Harvesting and storage	3.50	0.63	(6) 3.53	0.43	(9) 3.49	0.73	(12) 3.31	0.36
Vertebrate control	3.49	0.77	(19T)3.10	0.32	(10) 3.47	0.83	(8) 3.71	0.66
Fertilization	3.46	0.86	(12) 3.36	0.48	(11) 3.44	0.93	(11) 3.35	0.81
Pollination and fruit set	3.42	0.67	(11) 3.39	0.29	(12) 3.42	0.74	(13) 3.44	0.60
Field planting	3.40	0.77	(19T)3.10	0.60	(15) 3.36	0.78	(10) 3.66	0.77
Construction and maintenance of needed facilities	3.33	1.04	(9) 3.46	0.80	(14) 3.38	1.05	(17) 3.13	1.11
Management	3.31	1.09	(10) 3.43	0.83	(13) 3.41	1.11	(18) 2.97	1.10
Marketing	3.29	0.94	(15) 3.20	1.03	(17) 3.29	0.97	(14) 3.32	0.85
Selection of variety	3.22	1.22	(18) 3.13	0.90	(16) 3.33	1.18	(19) 2.95	1.44
Selection and preparation of site	3.17	0.81	(16) 3.16	0.42	(19) 3.16	0.77	(15T)3.22	1.04
Selection of rootstock	3.14	1.23	(7T) 3.49	0.73	(18) 3.20	1.17	(20) 2.84	1.52
Propagation	3.01	1.33	(13) 3.23	0.64	(20) 3.16	1.39	(21) 2.50	1.24
Irrigation	2.98	0.97	(14) 3.21	0.18	(21) 2.86	1.04	(15T)3.22	0.89

*$p < .05$ by analysis of variance. Means followed by the same letters are not significantly different from each other by the Scheffe test.

Table 4 displays all of the competencies listed in descending order of importance. Of the 210 competencies included in the survey, 195 were rated 3.0 (average competence) or higher.

Table 4. Growers' Perceptions of Competence for Entry Level Employment in Descending Order of Importance (n=71)

	x	s.d.
Exhibit honesty and personal integrity	4.29	0.92
Prune trees to establish scaffold branches	4.27	0.84
Identify and perform the different methods of pruning and training of apple trees	4.23	0.83
Operate equipment used on tree fruit farms (includes tillage, seeding, fertilizer & pesticide applicators, cultivation, harvesting, handling, storage, and processing equipment commonly used in the area).	4.21	0.82
See and anticipate the next task(s) which will contribute to success of the operation	4.21	0.72
this fruit by chemical control sprays	4.20	0.85
Prune newly planted trees	4.20	1.03
Calibrate herbicide or insecticide and fungicide sprayers	4.17	1.09
Apply weed control chemicals correctly and safely	4.11	1.00
Advise management and other workers about existing safety hazards and work to correct them	4.11	0.82
Follow directions	4.10	0.96
Operate carefully the tractors and other power units commonly found on tree fruit farms of the area	4.10	0.95
Diagnose malfunctioning equipment used on tree fruit farms (includes tillage, seeding, fertilizer & pesticide applicators, cultivation, harvesting, handling, storage and processing equipment commonly used in the area)	4.10	0.80
Operate sprayer equipment and power sources safely	4.08	0.87
Perform minor maintenance and service operations on the fuel systems (gas and diesel) of the power units commonly found on the tree fruit farms of the area in accordance with the operator's manual	4.07	0.79
Know and identify dangers of insecticide [illegible] carry-over on the fruit, environment [illegible] in application equipment	4.07	0.95
Exhibit courtesy in dealing with customers and employer	4.07	0.88
Accept and carry out responsibility	4.07	0.93
Follow employer's policies and procedures	4.06	0.88
Be dependable and thorough in completing work	4.06	0.94
Select and use appropriate systems of training for different sizes and types of apple trees	4.06	0.93
Interpret and follow chemical label directions for fungicide storing, mixing, and handling	4.06	0.93
Realize the importance and be able to read the label of a pesticide container	4.06	1.02
Adjust equipment used on tree fruit farms (includes tillage, seeding, fertilizer & pesticide applicators, cultivation, harvesting, handling, storage, and processing equipment commonly used in the area)	4.04	0.78
Check operation and performance maintenance operations on hydraulic systems of machines commonly found on tree fruit farms of the area as specified in the operator's manual	4.04	0.80
Operate all power units and all types of apple production equipment according to safety rules and regulations of each tool	4.03	0.91
Identify diseases and interpret their effect on the apple crop	4.03	0.91
Identify dangers of chemicals carry-over of fungicide residues in soil and application equipment	4.03	0.95
Exhibit initiative for job	4.03	0.83
Accept and profit from constructive criticism	4.03	0.94

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Table 4. Continued.

	x	s.d.
Plant trees the proper soil depth and distance to a given rootstock and/or variety with proper planting equipment (hole digger, tree transplanter, etc.)	4.01	1.04
Instruct pickers so bruise-free fruit is harvested	4.01	0.91
Identify, replace and/or repair defective parts on equipment used on tree fruit farms (includes tillage, seeding, fertilizer & pesticide applicators, cultivation, harvesting, handling, storage and pruning equipment) of the area	4.01	0.82
Perform field adjustments and minor field repairs on sprayers and power sources	4.00	0.77
Identify fruit and vegetable buds, age of spurs, and age of fruiting wood	4.00	0.77
Perform field adjustment and minor field repairs on weed control equipment and power sources	4.00	0.96
Read and interpret operator's manual for power units and all types of apple production equipment	4.00	0.97
Be willing to learn	4.00	1.13
Perform work assignments to the best of ability	3.99	1.03
Exhibit harmonious working relationship with co-workers	3.97	0.99
Lubricate, change oil and filters, and service air cleaners on power units commonly found on tree fruit farms of the area as specified in the operator's manual	3.97	0.95
Diagnose malfunctioning of the power units commonly found on tree fruit farms of the area (belts, chains, gears, hoses, seals, brakes, shafts, etc.).	3.97	0.84
Meet state requirements for fungicide use and application	3.97	0.98
Read and comply with manufacturer's label directions and legal requirements affecting recommended fungicide application, timing, and safety	3.97	0.99
Operate mechanical weed control equipment and power sources safely	3.97	0.95
Read and comply with manufacturer's label directions and legal requirements affecting recommended herbicide application, timing, and safety	3.97	1.05
Meet state requirements for the use of E.P.A. designated "restricted pesticide" and other non-restricted pesticide	3.96	1.02
Show a positive attitude toward job	3.96	1.02
Follow safety procedures and policies	3.94	1.01
Perform minor maintenance and service operations on ignition systems (gas & diesel) of the power units commonly found on tree fruit farms of the area in accordance with the operator's manual (spark plugs, battery, points, condensor, timing, etc.).	3.94	0.79
Read and comply with manufacturer's label directions and legal requirements affecting recommended fumigate application, timing, and safety	3.92	1.14
Calibrate fumigate applicators	3.92	1.20
Be loyal to the employer	3.91	1.14
Be willing to work overtime when needed	3.91	1.02
Have enthusiasm for job	3.90	0.99
Be flexible to change	3.90	1.02
Use handling machinery (forklifts, bulk bins, etc.)	3.90	0.92
Read and comply with manufacturer's label directions and legal requirements affecting recommended insecticide application, timing, and safety	3.90	0.98
Store, mix, and handle recommended insecticide conforming to manufacturer's label directions	3.90	0.97
Interpret and follow chemical label directions for fumigate storing, mixing, and handling	3.90	1.13
Identify and appraise the performance of recommended fungicide	3.90	1.10

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Table 4. Continued.

	x	s.d.
Store, mix, and handle herbicides conforming to manufacturer's label directions	3.89	1.03
Be punctual	3.89	1.15
Perform minor maintenance and service operations on cooling systems of the power units commonly used on tree fruit farms of the area in accordance with the operator's manual	3.87	0.79
Meet state requirements for herbicide use and application	3.87	1.03
Identify "spray injury" on fruit and trees, and be able to prevent spray injury in future	3.87	0.90
Realize that there is no smoking, no chewing, and/or no eating while spraying and working with pesticides	3.86	1.20
Regular attendance	3.86	1.23
Prepare all equipment for storage according to common practices and/or owner's manual	3.84	0.84
Plant trees in the orchard according to plan	3.83	0.96
Detect insect infestation	3.83	0.90
Operate fumigate applicators and apply fumigates properly and safely	3.83	1.20
Winterize sprayer for storage	3.83	1.00
Clean and disinfect sprayer equipment	3.80	1.00
Determine if different pesticides are compatible and mix different types of pesticides safely	3.80	1.04
Recognize dangers of carry-over of herbicide residues in the soil and in application equipment	3.80	1.02
Identify and evaluate damage caused by insects	3.80	0.99
Know and practice safety in harvesting fruit	3.80	1.10
Prune tree to encourage optimum color of fruit	3.79	1.04
Select and wear protective clothing while working with pesticides	3.77	1.06
Identify the method by which diseases are spread	3.77	1.09
Lay out the orchard for greatest efficiency in production and maintenance	3.77	1.22
Identify and distinguish between harmful and beneficial insects	3.76	1.07
Prune trees to avoid parallel branches and/or cross branches occupying the same space	3.76	1.03
Dispose of empty chemical containers in a safe manner as stated on pesticide label	3.73	1.10
Keep systematic spray records	3.70	0.97
Maintain and service tires on machines commonly found on tree fruit farms of the area as specified in the operator's manual	3.70	0.97
Apply a fertilizer to the soil by means of mechanical applicators (cyclone, liquid, etc.)	3.69	1.17
Make foliar application of plant nutrients to orchard trees	3.69	1.12
Identify and be able to use different types of pruning equipment	3.68	1.07
Evaluate life cycle of insects to determine appropriate control procedures	3.63	1.27
Select the best insect control program in terms of economic costs, returns, and environmental impact	3.63	1.43
Harvest apples by appropriate methods	3.63	1.04
Assure pollination by the choice of varieties and proper placing of pollinizer trees	3.62	1.11
Prepare the soil for planting apple trees	3.62	1.11

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Table 4. Continued.

	x	s.d.
Know characteristics of different apple varieties and know the varieties' different uses	3.61	1.05
Use limb spreaders to make tree limb crotches stronge and cause earlier fruiting	3.61	1.08
Be clean, neat, and well-groomed in appearance	3.61	1.04
Use of natural predators to control harmful insects	3.59	1.21
Control and/or prevent vertebrate damages in the orchard	3.58	0.93
Identify methods and sources by which insects are spread	3.56	1.08
Minimize erosion in newly planted orchard	3.56	1.03
Determine optimum time to harvest fruit crop	3.55	1.15
Label varieties of fruit	3.54	1.11
Add nutrients to soil according to soil test in best method to prevent nutrient loss	3.51	1.07
Fumigate proposed site for nematode, disease, etc. that are harmful to apple trees	3.51	1.16
Adjust fertilizer to provide optimum quality of fruit	3.51	1.29
Prepare material for foliar feeding	3.51	1.29
Operate grading and/or sorting machines and other various packing-processing machines (washers, waxer, scales, boxers)	3.49	1.14
Keep accounts of fruit enterprises which will provide information needed for income tax reports	3.49	1.35
Repair damages caused by vertebrate pests in the orchard	3.48	1.30
Prune trees to remove dead and/or diseased branches	3.48	1.30
Select a recommended disease control program in terms of expected costs and returns	3.48	1.25
Specify fertilizer application for the site from the soil test	3.48	1.19
Take appropriate leaf tissue samples for nutrient testing and quantitative analysis	3.48	1.09
Take appropriate soil samples for nutrient and pH testing in established orchards	3.46	1.03
Adjust inputs (labor, machinery, fertilizer, chemicals, etc.) based on relative costs and anticipated returns	3.46	1.39
Adjust nitrogen level for trees by the growth of new wood each year	3.45	1.22
Appraise performance of recommended insecticides	3.45	1.10
Install 110-volt electric wiring	3.44	1.42
Compare costs in relation to production with acceptable standards (labor costs per acre, production per acre, return per man, etc.)	3.44	1.33
Determine outlets offering best returns for fruits from the farm	3.44	1.26
Suggest varieties of fruit to meet needs of the customer	3.42	1.21
Prepare the site for planting trees (excavation, level, etc.)	3.41	1.11
Use harvesting aids (platforms, squirrels, etc.)	3.41	0.99
Evaluate environmental impact of disease control program	3.41	1.26
Construct and repair wood bin, pallets, boxes, etc.	3.40	1.14
Identify and evaluate damage caused by vertebrate pests (deer, rabbits, rodents, birds, etc.)	3.39	0.97
Grade fruit to meet government standards for retail sale	3.39	1.13
Meet state requirements for fumigate use and application	3.39	1.26
Thin fruit by mechanical methods	3.39	1.11
Determine production performance of each fruit enterprise in relation to acceptable standards	3.39	1.28

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Table 4. Continued.

	x	s.d.
Use fruit farm management analysis to determine profitability of the business	3.37	1.35
Identify common weeds	3.37	0.97
Have general knowledge of and obey government regulations	3.35	1.08
Sort harvested fruit into recognized grade requirements and standards	3.35	1.01
Determine most appropriate method for harvesting fruit	3.34	1.11
Plan the layout for a roadside fruit market	3.34	1.47
Select appropriate varieties of apple trees for specific purposes	3.34	1.38
Identify outlets for fruit products off the farm	3.33	1.25
Determine labor supply and number of employees needed	3.32	1.15
Identify different types of buds (vegetative & fruit)	3.32	1.43
Keep accounts which allow comparison of performance with farms reported by Cooperative Extension Service or other business analysis services	3.31	1.37
Construct an equipment and/or storage shed	3.31	1.21
Meet customers in the farm market and determine their needs and desires	3.31	1.19
Operate a mechanical prune machine (tree topping)	3.31	1.35
Select appropriate pollination varieties	3.30	1.28
Choose trees or rootstocks adapted to the area	3.30	1.37
Specify application of lime for the site from the soil test	3.30	1.26
Use attractants and/or traps to anticipate a rise in insect population so that spraying could begin	3.30	1.21
Use fruit farm management analysis to determine cash flow in the business	3.29	1.37

	x	s.d.
Use farm management analysis to determine appropriate credit terms	3.28	1.35
Maintain safe practices among customers for a "pick-your-own" marketing program	3.28	1.18
Set up cool storage room and/or control atmosphere room	3.28	1.46
Properly cover soil after application of fumigates	3.28	1.19
Determine the most economical source of supply	3.27	1.21
Recognize weed infestation problems and select the best method of control	3.27	1.14
Construct cooler room and/or control atmosphere room	3.27	1.60
Assure adequate pollination by use of bees	3.27	1.05
Display fruit for retail sale	3.27	1.20
Apply irrigation water according to specifications and soil-climate conditions	3.26	1.22
Develop a specified irrigation system under supervision	3.26	1.13
Use farm management analysis of fruit farms to determine uses of credit	3.26	1.37
Select sites which have air drainage and areas where frost damage is not a limiting factor in production	3.25	1.40
Plan a "pick-your-own" marketing scheme for tree fruits	3.24	1.37
Prepare fruit for the roadside market	3.24	1.19
Select rootstocks that are compatible to scion variety	3.24	1.49
Soil test proposed sites for nutrients	3.23	1.18
Construct a packing shed	3.21	1.49
Select healthy budding and/or graft plant materials	3.19	1.43
Select rootstock that will produce the wanted size of apple tree	3.18	1.32

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Table 4. Continued.

	x	s.d.
Select varieties of apple trees adapted to the soil and climate of the area	3.18	1.32
Package fruit for retail sale	3.18	1.12
Protect wounds on trees or young trees from possible damage by certain pesticide sprays	3.15	1.00
Use appropriate starter solutions on newly planted apple trees where recommended	3.15	1.11
Store apples in a cool storage room and/or control atmosphere room	3.15	1.32
Determine method of selling fruit crop	3.14	1.32
Adjust the fruit farming program based on reports from reliable sources	3.14	1.33
Select sites having adequate water drainage	3.13	1.32
Select a recommended fumigate in terms of expected costs and returns	3.13	1.36
Prune trees for mechanical harvesting	3.13	1.23
Bridge graft trees for mechanical and rodent repairs	3.09	1.34
Select necessary equipment and supplies needed for specific roadside market facility	3.09	1.34
Plan access and exit for roadside fruit market area	3.08	1.25
Identify government agencies with regulations pertaining to the apple production industry	3.08	1.22
Weigh or measure amount of fruit purchased by "pick-your-own" customers	3.07	1.09
Lay out driveways and parking space for roadside market	3.06	1.32
Identify sources of supplies for fruit production	3.04	1.12
Apply fertilizer to trees by means of irrigation water	3.04	1.45
Thin fruit by hand	3.04	1.29
Set up and move irrigation pipe according to given instructions	3.04	1.39
Use a pressure tester to determine optimum harvest time	3.03	1.11
Add organic matter to the soil where needed	3.01	1.00
Pollinate blossoms by bringing pollen to the trees to be pollinated	3.01	1.20
Specify rootstocks for the apple tree to be planted	3.01	1.27
Select disease resistant varieties for given area	2.99	1.29
Select disease resistant rootstocks for given area	2.94	1.30
Bud seedling apple tree of appropriate variety and rootstock	2.93	1.54
Make clefts and in-lay bark grafts (top working)	2.90	1.41
Select sites that have a deep top soil	2.86	1.18
Prepare soil to receive irrigation water	2.86	0.95
Apple wound protection	2.83	1.26
Water newly planted trees	2.83	1.28
Bench graft (whip or tongue method) apple tree of appropriate variety and rootstock	2.83	1.46
Select appropriate grafting materials and tools	2.80	1.34
Make moisture tests of soil to determine need for irrigation	2.81	1.19
Select sites that are free from wind swept areas	2.70	1.23
Keep daily evaporation records to determine need for irrigation	2.67	1.12
Mulch newly planted trees where the practice is recommended	2.66	1.15
Select sites having adequate water for irrigation	2.65	1.06

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Conclusions

1. Hypothesis 1 was rejected for all 21 competency areas. Regardless of the size of operation, growers were in agreement on their ratings of competence for entry level employment for 18 of 21 competency areas.

2. Hypothesis 2 was rejected for all 21 competency areas. Regardless of principal market outlet, growers were in agreement on their ratings of competence for entry level employment for 20 of 21 competency areas.

3. One hundred ninety-five of 210 competency statements were rated 3.0 (average) or higher by apple growers.

4. There was no difference between the responses obtained through the mail and responses obtained through personal interview on 20 of 21 competency areas.

Recommendations

Based upon the experiences gained from this study, it is recommended that:

1. The survey instrument developed in this study be used in competency assessments with other tree fruit (peach, pear).

2. The results of this study be used in developing instruction for vocational agriculture students studying apple production for entry level employment.

3. Because of numerous and additional competencies identified, curriculum developers use other resources in addition to the V-TECS catalog for identifying course content.

4. Research be done to compare ratings of employees and employers regarding the importance of each competency for entry-level employment in the apple production industry.

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TEACHER PERCEPTION: FFA MEMBERSHIP WITH NON-ENROLLMENT IN VOCATIONAL AGRICULTURE COURSES

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INTRODUCTION/NEED FOR THE STUDY

The FFA was formed and exists with the purpose of being an integral part of vocational agriculture. In 1950, the 81st Congress of the United States passed Public Law 740 which states in part, "The objects and purposes of the corporation (Future Farmers of America) shall be 1) to create, foster, and assist subsidiary chapters composed of students and former students of vocational agriculture in public schools ..." (1983 FFA Official Manual:68). This act is still in force and guides the policies of the National FFA regarding membership.

Classroom instruction in vocational agriculture, membership in the Future Farmers of America and a Supervised Occupational Experience Program are all considered integral parts of vocational education in agriculture. The ideal FFA member attends vocational agriculture classes, pursues a membership in the local FFA chapter plus is actively involved with a Supervised Occupational Experience Program; however, it seems that more and more of today's FFA members are not involved with all three activities.

Article V, Section B, Paragraph 2 of the Constitution of the Future Farmers of America states, "to retain membership during high school, the member must be enrolled in at least one vocational agriculture course during the school year and/or follow a planned course of study for an agricultural occupation which includes a supervised occupational experience program, the objective of which is establishment in an agricultural occupation." (1983 FFA Official Manual:58)

The "and/or" part of this paragraph which permits FFA membership for high school students without vocational agriculture class enrollment was included in the early 1970's with the primary justification of allowing FFA membership for students who, for various reasons, could not enroll in vocational agriculture.

Need for the Study

At the 55th National FFA Convention in 1982, in Kansas City, Missouri, an amendment to Article V, Section B, Paragraph 2 was proposed. The proposal was to eliminate the word "or" from the

phrase "and/or". The result of the proposed amendment would require both enrollment in vocational agriculture and a supervised occupational experience program for a student to be eligible for FFA membership. The amendment was defeated.

According to Coleman Harris, Executive Secretary of the National FFA Organization, this defeat was totally unexpected. (Harris:1983) Due to the apparent strong feelings of the delegates at the 1982 National FFA Convention against changing this article of the constitution, it was decided by the National FFA Board of Directors that research was merited to determine what affect this constitutional change would have on membership nationwide. This study is a result of that decision. It should perhaps be noted that a second attempt to change this section of the constitution was in progress at the 1983 National FFA Convention but was deferred by the National Officers pending the research findings of this study.

In view of the second attempt (1983) to alter criteria for membership, it would appear there still exists those who believe this change would strengthen the organization.

OBJECTIVES OF THE STUDY

Purpose

The purpose of this study was to determine the extent to which FFA membership without enrollment in vocational agriculture courses occurred throughout chapters. The study also attempted to determine the impact a proposed change to Article V, Section B, Paragraph 2 of the National FFA Constitution would have on vocational agriculture programs and FFA membership.

Objectives

The specific objectives of this study were identified as follows:

1. To determine the extent to which current high school FFA members are not simultaneously enrolled in a vocational agriculture course;

2. To determine the perceived circumstances/reasons for the high school FFA member not enrolling in a vocational agriculture course;

3. To determine the impact (on high school FFA membership and membership participation and opportunities) of a proposed constitutional change that would require vocational agriculture enrollment for FFA membership;

4. To determine what impact the FFA membership not enrolled in vocational agriculture has on the vocational agriculture teacher and program;

5. To determine how prospective changes in educational requirements, scheduling, etc., will affect high school enrollment in vocational agriculture/FFA.

METHODS AND PROCEDURES

Population and Sample

The population studied consisted of 8,447 FFA Chapters recognized by the National FFA Organization. Upon identifying 425 chapters representing a five percent random sample, an additional twenty five chapters were selected for a pilot study.

Data and Instrumentation

The data were collected through a mail questionnaire. The questionnaire was developed through joint efforts of The University of Maryland's Agricultural and Extension Education Department personnel and reviewed by members of the National FFA Board of Directors Research Committee and by selected members of the National FFA Center staff. A pilot study was conducted to validate the survey instrument. Twenty five chapters, representative of the population, were mailed the survey instrument. Data were returned by 15 chapters (60%). After minor modifications, the final form of the questionnaire was printed.

One advisor for each chapter in the sample (425) was sent the questionnaire and a cover letter explaining the study. They were asked to complete the survey instrument as completely and honestly as possible. The first mailing was made in early November, 1983. A follow-up letter and a second questionnaire was sent approximately two weeks later to those who had not returned the questionnaire.

Returns

Two hundred and seventy three questionnaires were returned, of which 269 were useable. Two were eliminated because a vocational agriculture program was no longer offered at the school. The other two eliminated were completed by junior high schools, which were not part of this study. A return of 63.3% was deemed useable. The sample represented 46 out of a total of 53 states and provinces served by the National FFA Center. Returns were received from 42 states. Regional distribution was as follows: Eastern (20), Southern (73), Western (66) and Central (110).

Analysis

The returned data were analyzed with the Statistical Package for

the Social Sciences (SPSS) program at The University of Maryland's Computer Science Center. Statistics untilized included: frequencies, means, percentages, cross-tabs and the chi-square tests of significance.

RESULTS: FINDINGS, CONCLUSIONS, RECOMMENDATIONS

Findings

Findings presented are based on data obtained from 269 chapter advisor questionnaires and records of the National FFA Center. Beginning with general background information, the findings will be presented in accordance with the objectives of the study.

Data obtained to provide general background information on the population surveyed included: areas of instruction, length of classes, format of classes, when chapter meetings are held and predicted attendance of high school students in college programs.

The most common area of instruction was agricultural production followed by agricultural mechanics. In the Eastern Region, however, agricultural mechanics ranked first and agricultural production second. Other areas taught that respondents viewed as being outside of the subject matter areas provided by the researcher include: Fundamentals of Agriculture, Citrus Production, Animal Science, Agricultural Science, Aquaculture, Agricultural Cooperative Training, Home Maintenance, Groundskeeping, Horticultural Mechanics, Landscape and Nursery Production, Agricultural Economics, Conservation, and Horse Management.

When asked the length of a single period class in their school, the average time indicated was a 55 minute period. A single period class was found to range from: 20 minutes (a module) to 90 minutes.

The scheduling format of vocational agriculture classes was requested. The majority of vocational agriculture classes (67%) were found to be scheduled in a single period time frame. Twenty-five percent of the teachers indicated other combinations of class lengths. These combinations were a composite of three general categories provided by the author.

FFA chapter meetings are held both during school and after school. A wide variety of replies were received from the teachers when questioned about this subject. There did not seem to be any pattern to the times when FFA chapter meetings are held. Teachers reported having anywhere from 0% - 100% of chapter meetings during school or 0% - 100% of chapter meetings after school. The majority of teachers reported a combination of meeting times.

Expected enrollment of vocational agriculture students in post-secondary institutions was solicited. Reported data indicated that 3,234 students out of 17,997 are expected to attend a four year college and

3,947 students out of 17,997 are expected to attend a two year college. The figures were obtained by taking the estimate given by the teacher of the percent of students who will attend two year or four year college programs and multiplying it by the total vocational agriculture enrollment reported for the department.

Findings relative to Objective 1: To determine the extent to which current in-school FFA members are not simultaneously enrolled in a vocational agriculture course.

The extent to which current in-school FFA members are not enrolled in vocational agriculture classes is a major concern. An attempt was made to ascertain enrollment and membership data.

Based on the data obtained, the average size FFA chapter membership is 54 while the average vocational agriculture department is 67 students. The data indicates a trend of more students in the vocational agriculture classes than enrolled as members of the FFA. This trend was expected (based on the literature review), however, further scrutiny of the data also indicated high school FFA membership without concurrent vocational agriculture enrollment. The gap between vocational agriculture enrollment and FFA membership will be greater with occurrences of non-enrolled high school FFA members.

Thirty-eight chapters reported high school members in their FFA chapters that are not enrolled in vocational agriculture classes. This is 14% of the total chapters responding. Looking at the data geographically, FFA membership with non-enrollment in vocational agriculture is occurring in 19 out of the 42 states represented in the sample (45%). Tables 1, 2, and 3 further depict the occurrence of non-enrollment of FFA members in vocational agriculture. Table 1 reveals the distribution of cases throughout the FFA regions. Table 2 illustrates these occurrences according to states.

TABLE 1

Distribution Of FFA Chapters Reporting Non-Enrollment Of FFA Members In VOAG By FFA Regions

Region	Number Returns	Number Reporting Non-Enrollment	Percent of Total Cases
Eastern	20	2	5%
Southern	73	11	29%
Western	66	11	29%
Central	110	14	37%
TOTAL	269	38	100%

TABLE 2

Distribution Of Recorded Occurrences Of FFA Members
Without Enrollment In VOAG

State	Number in Sample	Number of Reported Occurrences	Percent of State Occurrences	Percent of Total Occurrences
Alabama	6	1	17%	3%
Arizona	1	1	100%	3%
Connecticut	2	1	50%	3%
Florida	15	3	20%	8%
Georgia	11	2	18%	5%
Illinois	15	4	27%	11%
Indiana	9	1	11%	3%
Iowa	12	3	25%	8%
Kansas	3	2	67%	5%
Maryland	4	1	25%	3%
Minnesota	11	2	18%	5%
Nebraska	4	1	25%	3%
North Carolina	9	1	11%	3%
Oregon	2	1	50%	3%
South Carolina	2	1	50%	3%
Texas	27	9	33%	24%
Wisconsin	13	1	7%	3%
Washington	6	1	17%	3%
TOTAL	152	38		99%

Table 3 summarizes the occurrences according to grade levels. Although FFA members without concurrent vocational agriculture enrollment occurs at all grade levels, it seems to be somewhat more common at the upper grade levels (junior and senior).

It is believed that additional occurrences of FFA members without enrollment in vocational agriculture exist, however, the instrument failed to document the occurrence. Additional follow-up is recommended to further quantify existing conditions.

TABLE 3

Occurrences Of FFA Membership Without VOAG Enrollment
Grouped By High School Grade Level

		Grade Levels			
Region	Total	Senior	Junior	Sophomore	Freshmen
Eastern	2	2	2	1	2
Southern	11	10	8	6	1
Western	11	10	8	3	0
Central	14	10	9	4	1
TOTAL	38	32	27	14	4

Findings relative to Objective 2: To determine the types of circumstances/reasoning which hinder the high school FFA member from enrolling in a vocational agriculture courses.

Respondents were asked, "Do the students in your school have the opportunity to take free electives so that all students who wish to enroll in vocational agriculture classes can do so?" Ninety three percent reported students do have the opportunity to elect vocational agriculture and 7% reported students do not have this opportunity.

In response to the question, "Do courses in vocational agriculture qualify as electives fulfilling graduation requirements?", 97% reported vocational agriculture fulfills an elective graduation requirement while 3% report that is not the case in their school.

When asked, "With current conditions in your school, will vocational courses fit into a student's college preparatory program?", 85% indicated vocational courses do fit into college preparatory programs while 14% reported vocational agriculture courses do not.

Respondents were asked to agree or disagree with a battery of statements that presented plausible causes of non-enrollment in vocational agriculture by high school FFA members. Those responding with strongly agree or agree were placed in the agree category and those giving a strongly disagree or disagree response were grouped in the disagree category. Those that indicated undecided or no opinion were disregarded. Three statements received in excess of 50% agreement by those responding. In rank order, they are: 1) Students often need courses required for graduation which conflict with vocational agriculture courses. (78%) 2) Vocational agriculture courses routinely conflict with college prep courses. (56%) 3) Students leave vocational agriculture because they develop new or other interests outside of agriculture. (51%) See Table 4.

Findings relative to Objective 3: To determine the impact (on high school FFA membership and membership participation and opportunities) of a proposed constitutional change that would require vocational enrollment for FFA membership.

Item 15 in the survey instrument indicated the National FFA Organization is considering a constitutional change that would have required a student to be enrolled in a vocational agriculture class and conduct a supervised occupational experience program in order to become and remain a FFA member in high school.

Respondents were asked if they felt the National FFA should adopt such a requirement. 55% supported adoption of such a requirement, 42% were opposed and 3% undecided. No significant difference was found among regions.

Those surveyed were then asked what might happen if the amendment does take effect. In answering, 1% reported chapter FFA membership would increase, 44% felt chapter membership would decrease and 54% stated chapter membership would be unaffected. One percent did not respond to the question. No significant difference between regions was found.

Findings relative to Objective 4: To determine what impact the FFA membership not enrolled in vocational agriculture has on the vocational agriculture teacher and program.

Teachers were asked to respond to the following three questions relative to their work with FFA members who are not currently enrolled in their vocational agriculture class(s):

1. "In your estimation, how much time do you spend working with FFA members who are not currently enrolled in your vocational agriculture class(s)?"

2. "Do you believe that it is your job to work with FFA members who are not enrolled in a vo-ag class?"

3. "Do you have any problems with the administration accepting your working with these students as part of your job?"

TABLE 4

Possible Reasons Why Students Leave VOAG Classes

Statements of Reason	Teacher Response	
Students often need courses required for graduation which conflict with vocational agriculture courses.	Agree	78%
	Disagree	10%
Vocational agriculture courses routinely conflict with college prep courses.	Agree	56%
	Disagree	26%
Students leave VOAG because they develop new or other interests outside of agriculture.	Agree	51%
	Disagree	26%
Activities such as sports, band or chorus make it difficult for students to enroll in Vocational Agriculture.	Agree	45%
	Disagree	39%
Other vocational courses attract students away from vocational agriculture.	Agree	39%
	Disagree	42%
Students are advised not to take vocational agriculture.	Agree	22%
	Disagree	50%
The co-op program in school competes for vocational agriculture students.	Agree	22%
	Disagree	50%
Students leave VOAG because they have already taken all VOAG courses offered.	Agree	18%
	Disagree	69%

In response to question one, 56% of the teachers reported spending one to three hours per week with non-enrolled students.

In response to the second question, 74% indicated they believe working with the non-enrolled vocational agriculture student is a part of their job; while 20% did not believe this to be the case. Six percent were undecided. Significance among regions was not found.

In response to the last question, 85% of the teachers do not encounter problems with the administration accepting their working with the non-enrolled vocational agriculture students. Seven percent reported having problems with their administration. The Eastern region reported having the highest percentage with 10% of the teachers indicating they encounter problems with administrators. The Southern, Western, and Central regions reported 4%, 6%, and 8% respectively. No significant difference was found among regions.

Findings relative to Objective 5: To determine how prospective changes in educational requirements, scheduling, etc., will affect high school student enrollment in vocational agriculture/FFA.

Questions were asked focusing upon both increasing graduation requirements and increasing college entrance requirements. In response to the question, "Are the course requirements for graduation being increased in your school?", 83% of the teachers responded yes, 14% no, and 3% did not respond. A difference among regions significant at the .001 level, was recorded for this question. Of those indicating that graduation requirements are being increased, 46% felt that this action will reduce enrollment in vocational agriculture courses while 33% do not believe enrollment will be affected.

When asked, "Would the way your school handles the increasing requirements for college entrance (such as having a year of a foreign language), have any effect on vocational agriculture enrollments?" 62% responded in the affirmative. Thirty six percent said no and 2% did not respond. Those answering yes, were asked to provide their reasons. From those given, the author concluded increasing requirements will make it extremely difficult for students to enroll in vocational agriculture as an elective. Students may have to make a decision as to which course of study they wish to follow, vocational or academic.

Conclusions

The following conclusions are presented as they relate to the objectives set forth at the beginning of the study.

1. High school FFA membership without concurrent enrollment in vocational agriculture does exist. Fourteen percent (38) of the chapters who returned the questionnaire, reported having current in-school FFA members who were not enrolled in vocational agriculture. The distribution of these chapters regionally are 5% (2) in the Eastern region, 29% (11) in the Southern region, 29% (11) in the Western region and 37% (14) in the Central region.

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2. The circumstances/reasons most frequently given for the occurence of high school FFA membership without enrollment in vocational agriculture courses are: (a) scheduling conflicts and (b) students develop other interests outside of agriculture.

3. A change in the constitution to require vocational agriculture enrollment for FFA membership would appear to have a varied impact on chapter membership. Of those responding, 1% (3) predicted an increase in chapter membership, 44% (117) predicted a decrease and 54% (146) no appreciable change. Teacher support was also varied. Fifty five percent (149) would support a constitutional change requiring enrollment in vocational agriculture for membership in FFA. Forty two percent (113) would not support such a change and 3% (7) were undecided.

4. Vocational agriculture teachers/chapter advisors do spend time working with FFA members not enrolled in vocational agriculture classes. Fifty six percent (151) reported spending between one to three hours per week with non-enrolled FFA members. Seventy four percent (199) indicated it was part of their job to assist these students.

5. There are situtations or circumstances that prevent high school FFA members from enrolling in vocational agriculture courses. Those found in the study tend to fall into two general categories: increased requirements and decreased flexibility for college bound students; and a nationwide trend to increase academic requirements for all high school graduates.

Implications and Recommmendations

High school systems appear to be directing students to declare themselves as either college bound, vocational or general. The scheduling systems found in high schools do not appear to provide flexibility for students to take courses outside their own "track". Inflexibility in the curriculum of high school students has grave implications for vocational agriculture and the FFA. There may be an increasing trend for college bound agriculture students to forego vocational agriculture classes. A constitutional change to require vocational agriculture enrollment for continuing membership of high school students in FFA would mean the college bound student would also have to give up their affiliation with the FFA. With the general trend of college preparatory programs and scheduling in the high schools, we may expect to find a decrease in the vocational agriculture class enrollments and FFA by college bound students. What effect will these circumstances have on a college bound student's decision to major in agriculture and more specifically agricultural education?

In reviewing data implying a trend to increase academic requirements for high school graduation, it appears that students have less opportunity to select electives. Students appear limited in what they

can choose and often are required to decide between a vocational course and an academic course required for graduation. The scheduling of academic courses opposite vocational agriculture courses also creates conflicts for non-college bound students resulting in non-enrollment with continuing membership in the FFA.

Knowledge of these occurrences, and reasons and circumstances of students is salient to everyone involved in agricultural education. In view of the findings and suggested implications of this study, the future of vocational agriculture and the FFA will require carefully planned program changes. Modifications must maximize the effectiveness of the program given the many constraints being placed upon it by changes in general and college preparatory education.

Recommendations

In furthering this research, the author offers the following recommendations.

1. Distribute the findings of this study to National FFA Officials, the National FFA Officer team, State FFA personnel, and the local chapters especially those who participated in the study.

2. Develop, administer and analyze an FFA Member Questionnaire, in the very near future, to further support or reject the findings of this study.

3 Survey state staff to determine what effect, if any, FFA membership without concurrent vocational agriculture enrollment has on state FFA personnel.

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THE RELATIONSHIP BETWEEN CHARACTERISTICS OF COLORADO'S AMERICAN FARMER DEGREE RECIPIENTS FROM 1968 TO 1977 AND THEIR CURRENT OCCUPATIONAL STATUS

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INTRODUCTION

Vocational agriculture is an integral part of the education system in over 9,000 high schools in America. With the incorporation of vocational agriculture in the curriculum, these high schools are better able to meet the students' individual needs by providing increased educational opportunities (Barrick, 1982, p. 3).

Vocational education in agriculture has changed significantly in the last two decades. Vocational agriculture, which was once predominantly production agriculture, has expanded into many different occupational areas to meet the growing needs of its clientele and the agricultural industry. To meet the occupational needs of students and to prepare them for entry into and advancement in specific occupations in agriculture, the total agricultural education program has been divided into the following major occupational areas: agricultural production, farm management, ornamental horticulture, forestry, agricultural products, agricultural mechanics, agricultural resources, and agricultural supply and service.

The vocational agriculture program in the United States is made up of three integral components: classroom and laboratory instruction, supervised occupational experience program (SOEP), and Future Farmers of America (FFA) activities. The FFA is a national organization of, by, and for students of vocational agriculture. Since its beginning in 1928, the FFA has been committed to the development of leadership, citizenship, and cooperation. Through participation in FFA activities, students develop the leadership and personal competencies necessary for occupational success.

In 1971, Welton noted that with the expansion of vocational agriculture course offerings, the Future Farmers of America had become cognizant of the need to re-examine and re-evaluate the nature and effectiveness of the FFA program at local, state, and national levels. Wilson (1969) stated, "It appears that many of our problems and concerns are at the national level . . . the FFA must remain oriented to the agricultural occupations" (p. 56). McCracken declared, "Research is needed to ascertain the value added by the FFA in preparing students for employment" (1982, p. 114).

A large number of local and state follow-up studies have been conducted on vocational agriculture completers. The research indicated that many master's theses and staff studies have been follow-up studies of past State Farmer Degree recipients and past state FFA officers. A review of literature yielded very little research on the occupational status of American Farmer Degree recipients. The only published research related to the follow-up of American Farmer Degree recipients was conducted by W. H. Wayman of West Virginia in 1970.

A major purpose of the Future Farmers of America (FFA) is encouraging members to establish goals and strive toward productive careers in the agricultural industry (Kantner, 1965, p. 122). The FFA degree system, which encourages members to advance through a series of degrees from Greenhand to Chapter Farmer, State Farmer, and American Farmer, is based on goal setting and achievement in agricultural careers (American Farmer Degree Handbook, 1981).

To be eligible for any of the degrees, students must display achievement in a supervised occupational experience program as well as participation in FFA leadership and personal development activities. The American Farmer Degree, the highest degree an FFA member can earn, recognizes exceptional progress toward a student's occupational goal (American Farmer Degree Handbook, 1981).

The number of American Farmer Degrees awarded annually to candidates is based on the state FFA membership. Each state is eligible to recieve two degrees for the first 500 members, one degree for the next 500 memebers, and one degree for each 666 2/3 additional members, rounded to the nearest whole number (Official FFA Manual, 1980, p. 61).

According to the National FFA organization, the purpose of the American Farmer degree is to:

1. Encourage successful establishment in an agricultural occupation;

2. Develop in FFA members an increased sense of responsibility;

3. Provide the continued opportunity for FFA members to acquire knowledge, skills, and leadership abilities;

4. Provide new and greater challenges to those who have earned their state degrees;

5. Encourage FFA members to stay actively involved in the FFA following graduation from high school;

6. Recognize FFA members whose supervised occupational experience programs show comprehensive planning and growth;

7. Provide recognition at the highest level to FFA members for outstanding leadership and cooperation in individual chapter and community activities (American Farmer Degree Handbook, 1981, p. 2).

RATIONALE FOR THE STUDY

The overall goal of the vocational agriculture program is to prepare students for employment in the agriculture industry. Progress toward a career in agriculture is measured through the American Farmer Degree application which is based on the candidates' accomplishments in the vocational agriculture program, and school and community activities. The American Farmer Degree requires a high level of performance in areas important to agricultural occupations. While minimum qualifications are established for the American Farmer Degree, the number of persons receiving the degree each year is restricted to a certain portion of the membership in each state having the highest score. The overall score on the degree application indicates the candidate's progress toward becoming established in agriculture.

PURPOSE OF THE STUDY

The major purpose of this study was to investigate the relationship between the current occupational status of American Farmer Degree recipients in Colorado from 1968 through 1977 and their occupational and educational experiences at the time of application for the degree, selected demographic characteristics at the time of application, and their occupational and educational experiences since receiving the degree.

RESEARCH QUESTION

What was the relationship between the recipients' current occupational status and the following factors describing their progression toward establishment in an occupation?

Occupational and educational experience at the time of application for the degree:

1. Type and amount of vocational education completed.
2. Type and amount of supervised occupational experience program (S.O.E.P.)
3. Type and amount of employment related to S.O.E.P.
4. Extent of involvement in operation and management of S.O.E.P.
5. Extent of management and operational efficiency of S.O.E.P.
6. Extent of participation in school and community leadership activities.
7. Type and amount of earnings other than S.O.E.P.
8. Total net worth.
9. Total S.O.E.P. score.
10. Total leadership score.
11. Served as a state officer.
12. Application category.

Selected demographic characteristics at the time of application:

13. Father's occupation at the time of application.
14. Mother's occupation at the time of application.
15. Father's level of education at the time of application.
16. Mother's level of education at the time of application.

Occupational and educational experiences since receiving the degree:

17. Level of education.
18. Type of post-secondary school attended.
19. Major area of study at post-secondary level.
20. Employment other than current occupation since receiving the degree.

In addition to the information about current occupational status, the following information was collected:

21. Current participation in community activities.
22. Current participation in school related activities.
23. Current participation in church related activities.
24. Current participtaion in agricultural organizations.
25. Current part-time employment.
26. Plans for future employment in current occupation.

DESIGN AND METHODOLOGY

POPULATION AND DESIGN

An ex post facto design was utilized. The target population for the study was 52 Colorado American Farmer Degree recipients from the years 1968 through 1977. The accessible population was 49 American Farmer Degree recipients, since three recipients of the degree were excluded from the study because their applications were inaccessible.

DATA AND INSTRUMENTATION

A panel of experts scored the American Farmer Degree applications. The panel was selected from teacher educators, state staff, and graduate students in Ohio. The criteria for selecting panel members were based on the individual's knowledge of the total vocational agriculture program, experience in teaching vocational agriculture, and previous experience using the instrument in evaluating American Farmer Degree applications.

Reader reliability was utilized to ascertain the consistency of the raters. Reader reliability indicates how closely two or more readers agree in rating the same set of papers (Ebel, 1972, p. 276). An application was selected at random and a test, re-test procedure was utilized to obtain the reliability coefficient (.92). The American Farmer Degree applications were randomly divided into five groups of applications. The place, time, and instructions for evaluating the applications were identical for all members of the panel. The scoring system used in evaluating the American Farmer Degree applications was based on a total of one hundred points. The point breakdown per area was:

1.	Candidate's vocational education program	0-3 points.
2.	S.O.E.P.	0-35 points
3.	Candidate's place of employment (status)	0-7 points
4.	Operation and management	0-3 points
5.	Management and efficiency	0-4 points
6.	Leadership	
	a. Offices held	0-10 points
	b. Leadership activities	0-8 points
	c. Group activities	0-5 points
	d. Recognition	0-6 points
	e. School and community	0-6 points

7.	Earnings other than S.O.E.P.	0-3 points
8.	Candidate's financial statement	0-10 points
	Total Points	0-100 points

A telephone questionnaire was constructed to gather data from the subjects. In designing the questionnaire, many of Dillman's (1978) suggestions were followed. Dillman states,

> "Great care must also be taken in wording questions to determine that they not only read well, but also sound well . . . the complete dependence on oral communication requires that careful attention be paid to the communicability of questions and the overall questionnaire format to ensure respondent concentration" (p. 203).

The telephone questionnaire was examined for content validity by faculty members at The Ohio State University. The instrument was field tested by four graduate students in the Department of Agricultural Education. The field test panel reviewed the instrument visually and audibly for organization and clarity. The instrument was pilot tested with recipients of the American Farmer Degree in Ohio to examine the reliability of the instrument. Reliability, according to Kerlinger (1973), is the accuracy or precision of a measuring instrument.

The American Farmer Degree applications were evaluated by the panel of experts on May 16, 1983. The evaluation process took place under identical conditions with the evaluators receiving the same instructions. The telephone interviews were conducted between May 27 and June 10, 1983. Responses to the instrument were obtained from all 49 recipients of the degree.

DATA ANALYSIS

Descriptive statistics were used to analyze and summarize the data. Measures of central tendency, frequencies, percentages, measures of variance and association were the primary statistics used.

Data were keypunched onto computer cards and analyzed by the Statistical Package for the Social Sciences, (Nie, et al, 1975), and the Information and Research Computer Center at The Ohio State University. Open-ended questions from the interview were synthesized and listed.

The degree or magnitude of associations were calculated between the dependent variable, current occupation, and the independent variables.

SUMMARY OF FINDINGS AND CONCLUSIONS

The findings and conclusions of this study apply to the population of 49 American Farmer Degree recipients in Colorado from 1968 through 1977.

CHARACTERISTICS OF THE POPULATION

The American Farmer Degree recipients were categorized into three groups according to current occupation. Nearly three-fourths (70%) are owners of production agriculture businesses; slightly less than one-fifth (18%) are owners/employees of agricultural businesses; and 12% are owners/employees of

non-agricultural businesses. The entire population is male and had an average age of nineteen years, eight months at the time of application for the degree.

Approximately one-half (47%) of all the recipients do not have part-time employment that contributes to their income. Nearly all (92%) of the recipients of the American Farmer Degree plan to continue their current occupation. Approximately four-fifths (82%) of the recipients are involved in community and church related activities, while three-fourths reported being involved with school related activities. Slightly less than one-fifth (17%) of the recipients do not have membership or participate in any agricultural organizations.

Four-fifths of the American Farmer Degree recipients reported having some type of formal education beyond the high school level. Slightly over half earned a Bachlor of Science degree. Over four-fifths of the recipients who graduated from a post-secondary institution majored in agriculture or agricultural-related fields.

Recipients of the American Farmer Degree who receive their degree in the production agriculture area tend to continue work as owners in production agriculture regardless of whether the recipients were high school graduates, two-year post-secondary degree recipients, or Bachelor of Science degree recipients. Recipients who receive their American Farmer Degree in the production agriculture area and received a graduate degree are currently owners/employees in non-agricultural businesses.

Since receiving the American Farmer Degree, slightly more than two-fifths of the recipients have had some other type of employment other than their current occupation. Eighty-six percent of the recipients' fathers were full-time farmer/ranchers at the time of application for the American Farmer Degree. Ninety-two percent of the recipients' mothers were full-time homemaker/farmer/ranchers. Eighty-six percent of the recipients' fathers had a high school education, and 100% of the recipients' mothers had a high school education. Fourteen percent of the recipients' fathers and 18% of the recipients' mothers received a four-year college degree.

Slightly less than three-fifths of the recipients had been a state officer in the Colorado FFA Association. Eighty-four percent of all the recipients received their degree in the production agriculture area, while the remaining portion received their degree in agricultural business.

RELATIONSHIP BETWEEN CURRENT OCCUPATION AND SELECTED FACTORS

In analyzing the relationships between the recipients' current occupation and each section of the American Farmer Degree application, eta coefficients were calculated. The eta coefficients ranged from .05 to .39, indicating negligible to low relationships. One major finding is that there is no relationship between scores on the various sections of the American Farmer Degree application, which indicate extent of occupational and education experiences at the time of application, and current occupational status. There are negligible to low relationships between current occupation and offices held score, operation and mangement score, school and community activities score, total leadership score, recognition score, earnings other than SOEP score, management and efficiency score, group activities score, supervised

occupational experience program score, vocational education program score, total SOEP score, total application score, and leadership activities score. Moderate relationships exist between current occupation and financial statement score and place of employment score.

Cramer's V coefficients calculated to describe the relationship between current occupational status and additional factors ranged from .12 to .48. There are low relationships between current occupation and current part-time employment, father's occupation, school activities, serving as state officer, and mother's occupation. Moderate relationships exist between current occupation and highest level of education, father's education, mother's education, community activities, church activities, application category, plans for future employment, and employment other than current employment since receiving the degree.

IMPLICATIONS

The primary objective of vocational agriculture programs is to prepare students for employment in the agricultural industry. One avenue for measuring a vocational agriculture student's progress toward an agricultural career is through the American Farmer Degree application. This application focuses on the candidate's accomplishments in the vocational agriculture program and in school and community activities. The American Farmer Degree requires a high level of performance in areas essential for success in agricultural occupations. Based on the findings of the study, the following implications are proposed.

For this specific population, the vocational program is accomplishing its purpose in that it prepares students for an occupation in the agricultural industry. Formal education beyond high school does not impede students of vocational agriculture from achieving the goal of having an occupation in agriculture.

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THE EFFECT OF A FLORAL MERCHANDISING AND DESIGN RECORD BOOK ON STUDENT ACHIEVEMENT

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INTRODUCTION

Historically, students who had been studying floral design and had submitted record books to the Pennsylvania State FFA Record Book contest had to use the Record Book of Practicum Skills (n.d.). Clearly this book did not meet all the needs of floriculture students.

Informal conferences with Pennsylvania vocational horticulture teachers seemed to indicate a need for a floral merchandizing and design record book. A review of literature indicated that there were both, a need for record-keeping skills in the floral industry, and that very few experimental studies examined the effects of a record-keeping system on student achievement. A new floriculture record book was needed by students who were studying floral design in Pennsylvania.

Rhodes (1979) developed a floral merchandising and design record book to meet this need. Field testing of the publication was needed to determine its effectiveness on student achievement.

OBJECTIVES

Purpose of the Study

The purpose of this study was to field test a floral merchandising and design record book. The relationships between the use of the record book and achievement in producing a profit making floral design and in cognitive development were examined.

Specific Objectives

1. To compare the cognitive achievements of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

2. To compare practicum floral design quality achievement of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

3. To compare floriculture business calculation achievement of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

4. To compare floral design income achievement of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

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Hypotheses

1. There is no significant difference in mean cognitive achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

2. There is no significant difference in mean floral design quality achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

3. There is no significant difference in mean floriculture business calculation achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

4. There is no significant difference in mean floral design income achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

METHODS

Experimental Design

The design chosen for the study was a modified separated-sample pretest-posttest design. Design 12c, as explained by Campbell and Stanley (1963), is a quasi-experimental design. Added to the standard separated-sample pretest-posttest design are three independent variables treated as additional post treatment observations. The design used in this study is shown diagrammatically as follows:

R	X_1	O_1	O_2	O_3	O_4	4 intact classes
R	X_2	O_5	O_6	O_7	O_8	4 intact classes

Eight schools with vocational horticulture-floriculture programs within the southeast quarter of Pennsylvania were selected according to sampling criteria. The eight programs were randomly assigned to one of the two levels of treatment. Four classes received the Floral Merchandising and Design Record Book and four posttests; four classes received only the teachers' traditional materials and four posttests.

The symbols represent the following:

R — represents random assignment of intact classes to one of the levels of the treatment.

X_1 — represents the students receiving the Floral Merchandising and Design Record Book.

X_2 represents the students receiving only the teachers' traditional instructional materials.

O_1, O_5 represent the cognitive posttest.

O_2, O_6 represent the practicum design-quality posttest.

O_3, O_7 represent the floriculture business calculation posttest.

O_4, O_8 represents the practicum design-income posttest.

The dependent variables in the study were (1) student achievement scores on a cognitive test; (2) student achievement scores on a practicum design-quality test; (3) student achievement scores on a floriculture business calculations test; and (4) student achievement scores on a practicum design-income test. The cognitive test was in the form of a multiple-choice written test and was administered as the first (O_1, O_5) set of posttests. The design-quality test required that each student create a round centerpiece flower arrangement at a ten dollar maximum cost to the designer. The test was evaluated according to the standard FFA floriculture contest score card. The floriculture business calculations test consisted on ten floriculture business problems with multiple-choice answers. The design-income test required students to complete the floral design cost sheet for the round centerpiece floral arrangement created for the design-quality test. The two levels of the variable in the study were (1) the floral merchandising and design record book, and (2) the teachers' traditional instructional materials.

Interaction and selection of the treatment limits the generalizability of the study. Since the study was conducted in a limited area of the state, no conclusive data to suggest that the target population of this study represents all vocational horticulture floriculture classes in Pennsylvania are available. Therefore all results are related back to the eight horticulture classes in the southeast quarter of Pennsylvania included in the study. Threats to external validity include: interaction, selection and treatment. Reactive effects of experimental arrangements, as explained by Tuckman (1978), were controlled by conducting the research under normal classroom conditions during the regular school calendar.

Development of Design Variables

The Floral Merchandising and Design Record Book, an independent variable, was developed by Rhodes (1979). A 50-question multiple-choice floriculture exam and a ten-question floriculture business calculation exam were developed to be used as dependent variables for this study. These tests were examined for content validity by two horticulture teachers in Pennsylvania and two faculty members of the Department of Agricultural and Extension Education at The Pennsylvania State University.

A floriculture arrangement practicum score card was adapted from the Pennsylvania State FFA Floriculture contest to be used as a dependent variable in the study. The final dependent variable, a floral design cost sheet, was developed to be used with each arrangement recorded in the record book.

Analysis

A standard t-test was used to test for significant differences between treatment groups. The study was conducted in the fall semester of 1981. Eight vocational horticulture teachers and 99 vocational horticulture students (eight intact groups) from eight high schools and area vocational-technical schools participated in the study. All schools were located in southeastern Pennsylvania.

RESULTS

Hypothesis 1

Hypothesis 1--There is no significant difference in mean cognitive achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials--was not rejected. The mean score for students receiving the Floral Merchandising and Design Record Book was 26.52, and the mean score for students receiving the teachers' traditional instructional materials was 25.88. The probability of significance was .57. Hypotheses were rejected at the .05 significance level.

Table 1. Student Scores on a Cognitive Test by Level of Instructional Treatment.

Instructional Treatment	n	Mean	s	t	Probability
Floriculture Record Book	56	26.52	4.82	- .57	.57
Traditional Instructional Materials	43	25.88	6.01		
Total	99	26.20	5.42		

Hypothesis 2

Hypothesis 2--There is no significant difference in mean floral design quality achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials--was not rejected. The mean score for students receiving the Floral Merchandising and Design Record Book was 84.38, and the mean score for students receiving the teachers' traditional instructional materials was 80.79. The probability of significant difference was .10. Hypotheses were rejected at the .05 significance level.

Table 2. Student Scores on a Practicum Floral Design Quality Achievement Test by Level of Instructional Treatment.

Instructional Treatment	n	Mean	s	t	Probability
Floriculture Record Book	56	84.37	8.37	-1.66	.10
Traditional Instructional Materials	43	80.79	12.13		
Total	99	26.20	5.42		

Hypothesis 3

Hypothesis 3--There is no significant difference in mean floriculture business calculation achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials--was not rejected. The mean score for students receiving the Floral Merchandising and Design Record Book was 6.54, and the mean score for students receiving the teachers' traditional instructional materials was 5.95. The probability of significant difference was .16. Hypotheses were rejected at the .05 significance level.

Table 3. Student Scores on a Floriculture Business Calculation Achievement Test by Level of Instructional Treatment.

Instructional Treatment	n	Mean	s	t	Probability
Floriculture Record Book	56	6.54	1.77	-1.42	.16
Traditional Instructional Materials	43	5.95	2.19		
Total	99	6.25	1.98		

Hypothesis 4

Hypothesis 4--There is no significant difference in mean floral design income achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials--was rejected. The mean score for students receiving the Floral Merchandising and Design Record Book was 6.87, and the mean score for students receiving the teachers' traditional instructional materials was 3.37. The probability of significant differences was .00. Hypotheses were rejected at the .05 significance level.

Table 4. Student Scores on a Practicum Floral Design Income Achievement Test by Level of Instructional Treatment.

Instructional Treatment	n	Mean	s	t	Probability
Floriculture Record Book	56	6.87	391.00	-6.62	.00
Traditional Instructional Materials	43	3.37	56.80		
Total	99	5.12	223.90		

Conclusion

The principal conclusion of the investigation was that the Floral Merchandising and Design Record Book was effective in helping students obtain a higher floral design income. The results supported the belief that the sudents who received the Floral Merchandising and Design Record Book would score higher on a practical floral design income test than students who received only the teachers' traditional instructional materials.

Recommendations

Based on the findings and conclusions resulting from this study, the review of literature, and the experience of the investigator in conducting the study, the following recommendations are made.

1. Teachers of vocational horticulture should encourage students to use the Floral Merchandising and Design Record Book to help increase the students' floral design income. The results of this study indicated that student floral design income was higher when they used the Floral Merchandising and Design Record Book.

2. The Department of Agricultural and Extension Education at The Pennsylvania State Universiy should carry the Floral Merchandising and Design Record Book for sale to vocational horticulture programs in Pennsylvania.

Recommendations for Further Study

1. Research should be initiated to determine the effects of the use of a floral merchandising and design record book on the ability of students to make decisions about related flower shop management practices.

2. The study should be replicated by having larger school and student population participation.

3. A study should be conducted to examine the effects of a floral merchandising and design record book on student achievement randomly assigning treatments to students.

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FACTORS INFLUENCING STUDENT SELECTION OF THE PENNSYLVANIA STATE UNIVERSITY'S COLLEGE OF AGRICULTURE*

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INTRODUCTION

Agriculture has been in a constant state of change for over 100 years. Today less than 3 percent of the American work force are farmers, yet the number employed in agriculturally related jobs remains relatively stable at about 20 percent of our nation's work force. The U.S.D.A. (1980) has projected that there will be a 13 percent shortage in the number of qualified college graduates needed in agriculture for 1983-1984. Compounding this problem is the present trend of decreased enrollments in agriculture at both the high school and college levels. As the number of students with agricultural backgrounds decreases and fewer students look to agriculture for career opportunities, information must be obtained that will help agricultural educators increase college enrollment to meet the growing demand for qualified graduates.

Need for the Study

Information was needed that would give faculty in the College of Agriculture at The Pennsylvania State University a clear, concise picture of the types of students enrolled in their programs. Information was also needed that would identify factors influencing a student's selection of The Pennsylvania State University's College of Agriculture. The College of Agriculture recruitment practices needed to be evaluated. The information collected was needed to develop new strategies for increasing enrollment and strengthening existing recruitment practices.

Departments within the College of Agriculture also needed to know the characteristics of students they were attracting and their agricultural backgrounds. This information allows for the development of more effective curricula within departments to meet the specific student needs relative to their background and experiences.

Jones (1975:2) stated: "It is essential for colleges constantly to examine and re-examine their philosophy, goals, and policies in order to recruit the type of student they would like to attract and also those whom they will in fact attract." McCoy (1983) conducted a study that determined if the objectives and goals for the College of Agriculture at The Pennsylvania State University were being accomplished and their perceived relevance to graduates of the college. To determine if a difference exists between students one is seeking and those who attend, Jones (1975:2) suggested: "An institution needs to examine the characteristics of its existing student body and potential student population."

OBJECTIVES OF THE STUDY

The major purpose of this study was to secure information to improve recruitment practices and to provide a profile of freshmen students in the College of Agriculture. The specific objectives of the study were:

1. To describe and compare the characteristics of those individuals attending and those not attending the College of Agriculture after being offered admission as freshmen.

2. To identify factors influencing individuals to attend the College of Agriculture after being offered admission as freshmen.

3. To identify factors influencing individuals not to attend the College of Agriculture after being offered admission as freshmen.

4. To develop a profile of freshmen attending the College of Agriculture at The Pennsylvania State University.

Limitations of the Study

The following limitation to the study was identified: the respondents were all freshmen students offered admission to Baccalaureate Degree Programs in the College of Agriculture at The Pennsylvania State University for the Fall Semester 1983. Therefore, any conclusions drawn from this study are limited to that population.

PROCEDURES

This was an ex post facto, descriptive research study that used a mail questionnaire. The questionnaire was designed to describe the characteristics of those individuals attending and those not attending The Pennsylvania State University after being offered admission to the College of Agriculture as freshmen, and to determine the factors influencing attendance status. To determine the differences between those freshmen attending and those offered admission but not attending, questions were developed around the following study areas: demographic information; precollege educational background information; and college selection information.

Survey questions regarding demographic characteristics, precollege education and college choice information were designed to accomplish objectives one and two of the study. Questions regarding demographic and precollege education information were also designed to accomplish objective three of the study.

Questions in each of the three study areas were drawn from review of related research, the researcher and Dr. James S. McCoy, recruitment coordinator for the College of Agriculture at The Pennsylvania State Univesity. Questions were then compiled into a sample questionnaire. This questionnaire was analyzed by a "panel of experts" consisting of thesis committee members, faculty, and graduate students. Their comments were utilized for adding, deleting and editing questions and format.

On September 12, 1983, the revised questionnaire was pilot tested with 22 College of Agriculture students enrolled at The Pennsylvania State University. Responses from this pilot test group were used to

determine content validity of the questionnaire. According to Ary, Jacobs, and Razavieh (1972:191), "Content validity refers to the degree to which a test samples the content area which is to be measured." Readability was the only characteristic of the questionnaire to be a problem. This was due to the fact that the questionnaire was processed using a dot-matrix printer. The final questionnaire was typed using a conventional typewriter before being reproduced.

The population for this study was all (census) individuals offered admission to Baccalaureate Degree Programs as freshmen in the College of Agriculture at The Pennsylvania State University, including those at Commonwealth campuses, for Fall Semester 1983. Names of individuals who accepted admission, declined admission or cancelled enrollment after admission were obtained from the admissions office. This resulted in a population of 650 individuals; 398 freshmen attending The Pennsylvania State University and 252 individuals offered admission but not attending The Pennsylvania State University, Fall Semester 1983.

Individuals indentified from the admissions list were mailed a packet of materials that included a cover letter, explanation of the study, the questionnaire and a stamped, addressed return envelope. The first mailing to 650 individuals was made on October 7, 1983 and resulted in 353 useable returns. A second mailing, consisting of a similar packet of information was made to all nonrespondents of November 2, 1983. The second mailing resulted in an additional 128 useable returns. A total of 480 useable returns were received which provided a 74 percent useable rate of return. Two of the identified individuals in the population were inaccessible due to nonforwarding mailing addresses. Two other individuals returned blank questionnaires with the statement that they had changed colleges.

RESULTS

Selected Findings

The analysis of data provided results regarding: 1) demographic information; 2) precollege educational background information; and 3) college selection information of individuals attending and not attending The Pennsylvania State University's College of Agriculture after being offered admission as freshmen for Fall Semester 1983.

Selected Demographic Information

Demographic information was collected and analyzed for individuals attending and individuals not attending the College of Agriculture. Table 1 presents selected characteristics of both groups. Individuals attending and those not attending were found to be similar. Almost 90 percent of the individuals attending were Pennsylvania residents, compared to 61.8 percent of those not attending. Over 50 percent of the individuals attending the College of Agriculture were from rural farms or rural non-farm areas, compared to less than 45 percent for the individuals not attending the College of Agriculture.

Table 1. Selected Demographic Information by Attendance Status.

	Attending		Not Attending	
	Frequency	Percent	Frequency	Percent
Gender				
Male	203	61.9	96	63.2
Female	124	37.8	56	36.8
No Response	1	0.3	0	0.0
	328	100.0	152	100.0
Age				
18 or under	287	87.5	143	94.1
19-21	35	10.7	9	5.9
22-24	2	0.6	0	0.0
Over 24	3	0.9	0	0.0
No Response	1	0.3	0	0.0
	328	100.0	152	100.0
Ethnic Background				
Asian	1	0.3	0	0.0
Black	7	2.1	0	0.0
White	320	97.6	150	98.7
Other or Unknown	0	0.0	2	1.3
	328	100.0	152	100.0
State of Residence				
Pennsylvania	295	89.9	94	61.8
Other	33	10.1	58	38.2
	328	100.0	152	100.0
Place of Residence*				
Rural Farm	88	26.8	28	18.4
Rural Non-Farm	92	28.0	40	26.3
Town	99	30.2	60	39.5
City	45	13.7	23	15.1
No Response	4	1.2	1	0.7
	328	100.0	152	100.0

*Place of residence was defined by population using the following criteria: rural non-farm = less than 10,000;
town = 10,000-50,000
city = greater than 50,000

The agricultural work experience of students in the College of Agriculture has been an area of serious concern in recent years. Table 2 shows that 31 percent of the individuals attending the College of Agriculture and almost 29 percent of the individuals not attending the College of Agriculture had agricultural employment while in high school. To give some indication of the type and degree of agricultural work experiences gained by individuals, they were asked to identify the major agricultural tasks they had performed. Both the individuals attending and those not attending the College of Agriculture were found to have limited agricultural work experience (see Table 3).

Selected Precollege Educational Background Information

Over 93 percent of all individuals offered admission to the College of Agriculture as freshmen for Fall Semester 1983 had completed academic high school programs. Less than 3 percent had completed vocational programs. There was no difference between the groups for size of graduating class. A larger percentage of individuals not attending the College of Agriculture after being offered admission as freshmen reported graduating in the top quarter of their high school class. A larger percentage of those not attending also reported obtaining SAT math and verbal scores in the range of 600-800 (see Table 4).

Selected College Selection Information

Individuals attending and not attending the College of Agriculture were asked to designate which of the 19 College of Agriculture majors they had planned to pursue. Animal Bioscience was most frequently cited by both groups. Forest Science and Wildlife Science were also frequently cited (see Table 5).

Individuals were asked to rank the top five factors influencing their decision to attend or not attend The Pennsylvania State University's College of Agriculture. Responses were tabulated to find the most frequently cited influences. Individuals attending cited the reputation of Penn State (79.3 percent) as the most frequent influence on attendance. Other factors frequently cited by those attending included, parents (52.7 percent), campus location (52.7 percent), cost (43.3 percent) and size of campus (25.6 percent). Those not attending Penn State cited campus location (42.8 percent) as the most frequent influence for not attending Penn State, followed by cost (37.5 percent), size of campus (36.2 percent), parents (30.3 percent), and financial aid (26.3 percent) (see Table 6).

Individuals not attending the College of Agriculture at The Pennsylvania State University were asked if they were attending another institution. One hundred thirty-three of the 152 individuals not attending reported that they were attending another institution. When asked why they selected that institution over Penn State, location was cited by 54.1 percent of the individuals. Cost (38.3 percent) was cited next most frequently and other colleges offered more practical experience (32.3 percent) ranked third (see Table 7).

Table 2. High School Employment by Attendance Status.

Employment in High School	Attending		Not Attending	
	Frequency	Percent	Frequency	Percent
Non-Agricultural Employment	151	46.0	81	53.3
Agricultural Employment	103	31.4	44	28.9
Not Employed	74	22.6	27	17.8
Totals	328	100.0	152	100.0

Table 3. Agricultural Work Experience by Attendance Status.

Agricultural Work Experience	Attending		Not Attending	
	Frequency	Percent	Frequency	Percent
	-------N=328------		-------N=152------	
Service and Repair Machinery	55	16.8	16	10.5
Service and Repair Tractors	48	14.6	13	8.6
Service and Repair Small Gasoline Engines	35	10.7	14	9.2
Operate Tillage Equipment	63	19.2	23	15.1
Operate Planting Equipment	51	15.5	23	15.1
Operate Harvesting Equipment	58	17.7	19	12.5
Milk Cows	47	14.3	21	13.8
Shear Sheep	12	3.7	2	1.3
Train Horses	19	5.8	15	9.9
Prune Fruit Trees/Vines	22	6.7	10	6.6
Pick Fruit/Vegetables	41	12.5	16	10.5
Spray Pesticides	40	12.2	17	11.2
Cut Firewood/Logs	76	23.2	21	13.8
Saw Logs	44	13.4	17	11.2
Operate Logging Equipment	10	3.0	6	3.9
Pot Bedding Plants	19	5.8	14	9.2
Greenhouse Work	17	5.2	14	9.2
Floral Arrangement	8	2.4	4	2.6
Process Ag Products	19	5.8	7	4.6
Test Soil	14	4.3	6	3.9
Keep Farm Records	36	11.0	12	7.9
Sell Ag Products	28	8.5	10	6.6
Inventory Stock	20	6.1	8	5.3
Stock Shelves	20	6.1	7	4.6
Other*	38	11.6	15	9.9

*Most responses related to small animal veterinary experiences.

Table 4. Precollege Educational Background Information by Attendance Status.

	Attending		Not Attending	
	Frequency	Percent	Frequency	Percent
High School Program Completed				
Academic	305	93.0	144	94.7
Vocational	9	2.7	2	1.3
General	13	4.0	4	2.6
Business	0	0.0	1	0.7
No Response	1	0.3	1	0.7
	328	100.0	152	100.0
Size of High School Graduating Class				
Small (less than 150)	70	21.3	32	21.1
Medium (151-399)	165	50.3	77	50.7
Large (400 or more)	92	28.0	42	27.6
No Response	1	0.3	1	0.7
	328	100.0	152	100.0
Rank in Graduating Class				
Upper 25%	182	55.5	101	66.4
Middle Upper 25%	88	26.8	34	22.4
Middle Lower 25%	34	10.4	10	6.6
Lower 25%	2	0.6	2	1.3
Don't Know	21	6.4	5	3.3
No Response	1	0.3	0	0.0
	328	100.0	152	100.0
SAT Scores				
Math				
000-200	0	0.0	0	0.0
201-400	25	7.6	10	6.6
401-600	232	70.7	90	59.2
601-800	40	12.2	41	27.0
Don't Know	20	6.1	8	5.3
Didn't Take	2	0.6	0	0.0
No Response	9	2.7	3	2.0
	328	100.0	152	100.0
Verbal				
000-200	0	0.0	0	0.0
201-400	41	12.5	15	9.9
401-600	228	69.5	107	70.4
601-800	28	8.5	18	11.8
Don't Know	20	6.1	8	5.3
Didn't Take	2	0.6	0	0.0
No Response	9	2.7	4	2.6
	328	100.0	152	100.0

Table 5. College Major by Attendance Status.

Major	Attending		Not Attending	
	Frequency	Percent	Frequency	Percent
Ag Business Mgmt	17	5.2	10	6.6
Ag Ec & Rural Sociology	5	1.5	1	0.7
Ag Education	4	1.2	2	1.3
Ag Engineering	3	0.9	6	3.9
Ag Mechanization	8	2.4	1	0.7
Ag Science	9	2.7	2	1.3
Agronomy	11	3.4	7	4.6
Animal Bioscience	87	26.5	28	18.4
Animal Production	24	7.3	13	8.6
Dairy Production	14	4.3	3	2.0
Entomology	0	0.0	2	1.3
Environ. Resource Mgmt	13	4.0	9	5.9
Food Science	9	2.7	1	0.7
Forest Products	3	0.9	1	0.7
Forest Science	37	11.3	10	6.6
Horticulture	15	4.6	5	3.3
Plant Science	2	0.6	3	2.0
Poultry Tech. & Mgmt	1	0.3	0	0.0
Wildlife Science	42	12.8	14	9.2
Don't Know	13	4.0	8	5.3
Others	5	1.5	18*	11.8
No Response	6	1.8	8	5.3
Totals	328	100.0	152	100.0

*A major portion of respondents specified Pre-Vet as their desired major.

Table 6. College Selection Influences by Attendance Status.

Influence	Attending		Not Attending	
	Frequency	Percent	Frequency	Percent
	-------N=328------		-------N=152------	
Parents	173	52.7	46	30.3
Vo-Ag Teacher	28	8.5	3	2.0
Other Teachers	21	6.4	12	7.9
Reputation of PSU	260	79.3	10	6.6
Cost	142	43.3	57	37.5
Financial Aid	43	13.1	40	26.3
Campus Location	173	52.7	65	42.8
Commonwealth Campus	30	9.2	25	16.4
Counselors	63	19.2	13	8.6
Former Students	68	20.7	6	3.9
Friends	61	18.6	23	15.1
Recruitment Personnel	22	6.7	15	9.9
Opportunity to Participate in Sports	14	4.3	19	12.5
Size of Campus	84	25.6	55	36.2
Availability of Social Activities	45	13.7	8	5.3
Personal Experience	58	17.7	33	21.7
On Campus Activities	42	12.8	7	4.6
Don't Know	24	7.3	29	19.1
No Response	6	1.8	0	0.0

Table 7. Reasons for Selecting Another Institution Over Penn State.

Reason	Frequency	Percent
	N=133	
Location	72	54.1
Cost	51	38.3
Offered More Practical Experience	43	32.3
Convenience	37	27.8
Financial Aid	30	22.6
Other	20	15.0
Better Institution	10	7.5
Program Not Offered	7	5.3
Lack of Two-Year Program	4	3.0

Table 8. Profile of the "Typical" College of Agriculture Freshman.

The "typical" College of Agriculture freshman:

Was a male
Was 18 years of age
Was white
Was a Pennsylvania resident
Was from a town or rural non-farm area
Completed an academic high school program
Graduated in a medium-size class (151-399 students)
Graduated in the top quarter of his class
Had combined SAT scores between 802-1200
Participated in high school sports
Was employed in high school
Worked after school, weekends and summers
Stated reputation, campus location, and parents were influences for attending PSU
Received financial aid
Planned to have non-agricultural work during the summer

Freshmen Profiles

Using the demographic, precollege educational background and college selection information for individuals attending the College Agriculture, a profile of the "typical" freshman was developed (see Table 8). Table 9 presents an example of freshmen profiles that were also developed for each of the 19 majors in the College of Agriculture.

Conclusions

This study gathered much data about the type of student that is being offered admission to the College of Agriculture at The Pennsylvania State University. Individuals attending the College of Agriculture after being offered admission as freshmen for Fall Semester 1983 differed slightly from those not attending after being offered admission. A much larger percentage of those attending were Pennsylvania residents. This finding is consistant with other research that has shown that most freshman college students tend to select a college or university close to home, usually in their home state. Of the individuals offered admission as freshmen, a larger percentage of those not attending reported graduating in the top quarter of their high school class and obtaining SAT math and verbal scores in the range of 600-800. Of the individuals offered admission as freshmen, those attending were most influenced to attend The Pennsylvania State University's College of Agriculture by parents, the location of the campus and cost. The individuals not attending after being offered admission as freshmen were most influenced not to attend by the location of the campus, cost, the size of the campus, and parents. Individuals not attending Penn State after being offered admission that were attending another institution selected that institution over Penn State because of campus location, cost, and it offered more practical experiences. Profiles of attending freshmen were developed for use by faculty and recruitment personnel to give them a concise picture of the types of students being attracted to their programs. The information could also be used in program planning and revision.

Recommendations

This study determined the characteristics of the types of students being attracted to the College of Agriculture at The Pennsylvania State University. Many of them are not surprising. A few of them point to areas where the College of Agriculture needs to reassess its policies and programs.

1. Increased emphasis needs to be placed on the recruitment of minority students.

2. The need for providing agricultural work experience and practical application of agricultural science should be seriously considered and pursued.

Table 9. Profile of College of Agriculture Freshmen by Major.

The "typical" freshmen had the following characteristics for each of the majors reported:

Ag Business N=17

Was a male
Was 18 years of age
Was white
Was a Pennsylvania resident
Was from a farm or rural non-farm area
Had parents with non-professional occupations
Completed an academic high school program
Graduated in a medium size class (150-399 students)
Graduated in the top quarter of his class
Had combined SAT scores between 802-1200
Participated in high school sports
Had non-agricultural employment in high school
Worked after school and weekends
Had no agricultural experience
Received financial aid
Planned to have agricultural work during the school year or summer

Ag Economics & Rural Sociology N=5

Was a male
Was 18 years of age
Was white
Was a Pennsylvania resident
Was from a rural farm area
Had fathers who were farmers and mothers who were homemakers
Completed an academic high school program
Had combined SAT scores between 802-1200
Took vocational agriculture in high school
Participated in high school sports, student government, FFA, music and service clubs
Had agricultural employment in high school
Worked after school, weekends and during the summer
Did not receive financial aid
Planned to have agricultural work during the school year or summer

Ag Education N=4

Was a male
Was 18 years of age
Was white
Was a Pennsylvania resident
Was from a rural farm area
Completed an academic hgh school program
Graduated in a small size class (0-150 students)
Took vocational agriculture in high school
Worked after school, weekends and summers
Has agricultural work experience
Received financial aid
Planned to have agricultural work during the school year or summer

Ag Engineering N=3

Was a male
Was 18 years of age
Was a Pennsylvania resident
Graduated in a small size class (0-150 students)
Graduated in the top quarter of his class
Had combined SAT scores in the range of 802-1200
Participated in high school sports, and marical activities
Had agricultural employment in high school
Worked after school and weekends
Had some agricultural work experience
Received financial aid

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3. The process of major selection in the College of Agriculture needs to be evaluated. The Animal Bioscience major seems to be out of proportion with other programs in the college.

4. Results of this study should be used as a tool in directing recruitment activities toward the types of students that are attending the College of Agriculture.

5. The effect of the Commonwealth campus system on attendance needs to be determined.

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The Affective Work Competency Development of Vocational Agriculture Students Involved in SOE Programs in New York State

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INTRODUCTION

Vocational agriculture currently has three major components: classroom/laboratory instruction, FFA and supervised occupational experience (SOE) programs. The combination of these three components provides the vocational agricultural student with a quality vocational agriculture program (Williams, 1983). Through supervised occupational experience programs, students apply agricultural knowledge and skills studied in the classroom and develop new skills such as those in the affective domain. Skills in the affective domain which relate to work attitudes, values and habits are referred to as affective work competencies (Kazanas, 1978). Competencies in the affective domain are just as important to successful employment as cognitive and psychomotor competency development which have been emphasized in vocational agriculture for many years (Petty, Stewart 1982).

Supervised occupational experience (SOE) programs have been identified as an essential component of a high quality vocational agriculture program. Presently, there is a decline in the number of vocational agriculture programs offering SOE programs (Miller, 1982). Where SOE programs are being offered, the level of critical problems (Cushman, Berkey, 1981) such as student SOE participation and the quality of supervision varies. As a result of these trends an increasing number of vocational students are not receiving the benefit of affective competency development which could be accrued through participation in high quality SOE programs. Information was needed in New York State about the status of SOE and the extent competencies in the affective domain are developed through participation in a quality SOE program. This information was essential for planning preservice and inservice educational programs on SOE.

OBJECTIVE

This study investigated the following problem: To what extent do the affective work competencies of New York vocational agriculture students involved in SOE programs vary by their level of participation in SOE, FFA and work experience participation (unrelated to the SOE program) as perceived by vocational agriculture students, their agriculture teacher and work supervisor.

The specific research objectives were to:

1. Identify and describe characteristics of (a) the vocational agriculture student involved with SOE, their vocational agriculture teacher, and work supervisor; (b) SOE programs; and (c) situational factors related to SOE programs.

2. Determine the level of affective work competency development of vocational agriculture students involved in SOE programs as perceived by the student, their teacher and work supervisor.

3. Determine the relationship between the student level of participation in SOE, FFA and work experience (unrelated to the SOE program) and the affective work competency development of vocational agriculture students.

METHODOLOGY

Instrumentation

The questionnaires which the students, teachers and work supervisors answered consisted of two parts: (a) the Affective Work Competencies Inventory (AWCI) which addressed the work behavior of the student while involved in a SOE program and (b) questions to obtain demographic information on the respondents. The teachers were also asked to complete a program questionnaire to gather information on situational factors related to SOE.

The AWCI which was developed in 1977 by H.C. Kazanas and D.P. Beach was modified for use with vocational students in 1979. The modified version was utilized in this study. The AWCI consists of 95 statements which relate to 63 affective work competencies grouped into 15 competency clusters. A seven point likert-type scale of 1 = never to 7 = always was used for rating the level of affective work competency development.

Population and Sample

Vocational agriculture programs for this research were identified which had the following characteristics:

1. Approximately 70% of the students had SOE programs.

2. Agriculture teachers visit a majority of the students a minimum of one time during the school year.

3. The program content area was Farm Production and Management.

4. The school was a comprehensive high school.

The population of schools which met the criteria were identified by using data collected in a Cornell follow-up survey of New York vo-ag programs and data from a Cornell survey of prospective student teaching centers. The initial list of programs was submitted to a panel of agriculture teacher educators and state supervisors for a final screening. Eighteen schools were selected which met the a priori criteria. Fourteen school systems agreed to participate in the research based on a preliminary invitation by the researcher. The fourteen schools formed the sampling units for the research.

A sample of agriculture teachers, students, and work supervisors was drawn from each of the fourteen school systems. The vocational agriculture teacher at the purposively selected vocational agriculture programs comprised the sample of teachers. A census of the student population of these programs was utilized according to the following criteria determined a priori:

1. Presently in grade 12.

2. Have completed at least one year of SOE.

3. Currently involved in a SOE program.

The sample of work supervisors was the supervisors of the students participating in this study. If the place of employment was a family (parent/guardian) owned agricultural farm/business, the work supervisor was the parent/guardian. If the place of employment was non-family owned, the work supervisor was the employer. Self-employed students did not have a work supervisor.

Data Collection

Each participating vocational agriculture teacher was mailed the necessary research materials. The teacher was responsible for distributing and collecting the completed questionnaires from the students and work supervisors. All completed research materials were mailed to the researcher by the participating teachers.

Twelve of the fourteen purposively selected comprehensive high schools which offer Farm Production and Management responded to the study. There were twelve teachers, sixty-nine 12th grade vocational agriculture students, and fifty-one work supervisors who returned useable questionnaires. The response rates were eighty-six percent, eighty-one percent and sixty-four percent, respectively, for teachers, students and work supervisors.

Data Analysis

The data obtained from the completed questionnaires were analyzed by computer, utilizing the Statistical Package for the Social Sciences (SPSS). Descriptive statistics and analysis of variance statistics were used to test the research hypotheses. The determinant level of confidence used for accepting the hypotheses was .05.

When significant differences were found to exist between the dependent and independent variables, a Sheffe' Multiple Comparison test was used to indicate the source of the significant differences.

FINDINGS

Demographic Information

Data were collected for selected characteristics of (a) students, teacher and work supervisors, (b) SOE programs and (c) situational factors relating to SOE programs.

Background information on the respondents was collected with regard to high school participation in: vocational agriculture, FFA and SOE. These characteristics were reported by frequency counts. Seventy-five percent of the vocational agriculture teachers and fifty-three percent of the work supervisors had vocational agriculture while enrolled in high school. One hundred percent of the participating students were enrolled in high school vocational agriculture. With regard to participation in FFA, seventy-five percent of the teachers and fifty-one percent of the work supervisors were members, while ninety-seven percent of the students were currently FFA members. Sixty-seven percent of the teachers and twenty-eight percent of the work supervisors who had high school vocational agriculture also had an SOE program.

Background information specifically related to the vocational agriculture students was collected. The level of FFA participation was determined for each student by assigning a value of : "0" for no participation in the FFA activity and "1" for each FFA activity in which the student participated. The value labels (level) of "none", "low", "medium" and "high" were then established, respectively, for the frequency of 0, 1 to 2, 3 to 5, and 6 to 7 activities. The mean number of FFA activities for each student was 3.9. Thirty-nine percent of the students were reported at the medium level. Low, high and none levels of participation were reported by 31.8 percent, 26.1 percent, and 2.9 percent of the respondents, respectively.

The term "work experience" was used in this study to describe employment of the student which was not part of the student's SOE program. Sixty-seven percent of the students participated in work experiences which were not part of their SOE program. Students indicated the number of hours worked and amount earned for their work experiences. For statistical analysis purposes, values were assigned to both the number of labor hours and the amount of earnings. Combined values for work experience participation were determined by adding the assigned values for labor hours and earnings. Since some of the students indicated more than one type of work experience an average of the combined values was computed. The levels of "none", "low", "medium" and "high" were established for the averaged combined values of 0, 1 to 4, 5 to 7

and 8 to 10, respectively. Thirty-eight percent reported at the low level. None, medium and high levels of participation were reported by 33.3 percent, 15.9 percent, and 13.0 percent respectively.

Data on selected characteristics of SOE programs were collected. Ninety-four percent of the students worked on a farm, of which 56.5 percent worked on a family (parent) owned farm and 37.7 percent worked on a non-family owned farm. None of the students were self-employed. To determine the level of SOE participation, the same process as described for the level of work experience participation was followed. Fifty-five percent of the students reported at the high level. The medium and low levels of participation were reported by 37.6 percent and 7.2 percent, respectively. The "none" level was not appropriate for SOE since student involvement in SOE was a criteria for this study.

Data were collected for several situational factors related to supervised occupational experience programs. These situational factors include teacher characteristics and vocational agriculture program characteristics. The SOE factors: "The teachers are employed during the summer for SOE program supervision" and "teachers are provided a school vehicle for SOE supervisory visits" were reported to be currently practiced in 83.3 percent and 58.3 percent of the schools respectively. These two factors were rated the highest in terms of importance for a high quality SOE out of 11 by the participating teachers. Table 1 portrays the current practice and perceived importance of factors influencing SOE quality.

Perceptions of the Respondents Concerning The Affective Developoment of the Student

A significant relationship was found to exist among the groups: ' students, teachers and work supervisors with regard to the perceptions about each of the fifteen competency clusters and the overall AWCI score. The perceptions of the work supervisors differed significantly at the .05 level from the perceptions of the students and the teachers on each of the fifteen clusters and overall score as indicated by the Sheffe Multiple Comparion Test. Table 1 shows the recorded mean values and standard deviations representing the respondent's perceptions regarding the development of each affective work competency cluster and the overall AWCI score. Significance levels are also identified for each cluster on Table 1.

Relationship Between Affective Work Competency Development and Student Levels of SOE, FFA and Work Experience Programs

Participation levels for SOE were low, medium and high. On 87 percent of the clusters, the means for the medium level of SOE participation were greater than the means for low and high levels. The means for a high participation level were greater (although not significant at .05) than those for a low level on all of the clusters. Relationships between the levels of SOE participation and the aff tive work competency clusters were not found to be significant. Table 3 shows the means, standard deviations and significance levels for the levels of SOE participation.

The levels of FFA participation which were established for use in this study were: none, low, medium and high. The fact that on 80 percent of the competency clusters, the means for the "none" level are greater than the means for the other levels should be discounted since the number of students at this level was two. A significant relationship was found to exist between the level of FFA participation and eleven of the competency clusters and the overall AWCI score. The means, standard deviations, significance levels and the source of the significant differences for the levels of FFA participation by cluster are displayed in Table 4.

Work experience participation levels which were established for this study were: none, low, medium and high. The means for the none level were greater than the means for the other levels in all instances. A significant relationship was found to exist between the level of work experience participators on eight competency clusters and the overall AWCI score. In Table 5, the means, standard deviation, significance levels, and sources of significant differences for the level of work experience participation are presented by clusters.

CONCLUSIONS

From an analysis of the data, the following conclusions were drawn:

1. At the purposively selected schools, a majority of the students are FFA members and work on a farm (family-owned or non-family owned) for their SOE program and have teachers who believe that SOE programs are an important components of vocational agriculture.

2. Teachers appear to be prepared to teach and supervise SOE in terms of teaching experiences, and educational course background; however, approximately one-half the individuals have a need for some additional training on the use of SOE. Perhaps, changes in the types of agriculture students and environments for implementing SOE could help explain the perceived need for additional training.

3. Situational factors related to SOE programs including teacher release time from school for supervision of projects, use a school vehicle for visits, teacher summer employment and requiring SOE for all students are important for a high quality SOE program. Yet, the majority of these factors are not in current practice in schools included in the study.

4. Vocational agriculture students, teachers, and work supervisors differ in their perceptions with respect to the level of affective work competencies developed by students through participation in SOE programs.

5. Students and their agriculture teachers believe that affective competencies are developed as a result of SOE to a greater extent than perceived by work supervisors. One explanation for the high teacher

rating is that they could be influenced by student behavior in the classroom, student participation in FFA activities and their own vested interest with regard to their own ability to supervise and guide student SOE .

6. Parents who serve as SOE work supervisors tend to rate student affective development lower than do SOE work supervisors who are not parents of the student.

7. In general, students with mediuim and high levels of SOE participation have a slightly higher development of the affective work competencies than those at a low level.

8. Participation in SOE has the highest association with student development in the affective area of "Considerate/Courteous" in comparison with other competency clusters investigated in this study.

9. The participation levels of FFA have a tendency to be related to the majority of the affective competency clusters including: "Ambitious", "Cooperative/Helpful", "Adaptable/Resourceful", "Accurate/Quality of Work", "Pleasant/Friendly/Cheerful", "Follows Directions/Responsive", "Careful/Alert/Perceptive", "Emotionally Stable/Judgemental/Poised", "Neat/Orderly/Personal Appearance/Manner", "Efficient/Quantity of Work/Achieving/Speedy". "Dedicated/Devoted/Honest/Loyal/Conscientious" and "Overall AWCI Score".

10. FFA participation has the highest association with student development in the AWCI area of "Considerate/Courteous" in comparison with other competency clusters when considering none, low, medium and high levels of FFA participation.

11. Students with a higher level of FFA participation tend to have a slightly higher development of affective work competencies than with low and medium levels. The largest difference comparing medium and high with the low level was in the areas of: "Accurate/Quality of Work", "Follows Directions/Responsive" and "Neat/Orderly/Personal Appearance/Manner". The researcher recognizes that the findings indicated that students with no FFA had the highest level of affective development. However, this case is discounted since only 2 of the 69 students reported for this category.

12. The level of work experience participation tends to be related to more than half of the affective competency clusters including: "Ambitious", "Cooperative/Helpful", "Adaptable/Resourceful", "Independent/Initiative", "Careful/Alert/Perceptive", "Considerate/Courteous", "Persevering/Patient/Enduring/Tolerant", Efficent/Quality of Work/Achieving/Speedy" and "Overall AWCI Score".

13. Students with no work experience which is not included as part of the SOE program have a better affective work competency development than

students with low, medium and high levels of work experience participation. The characteristics of age and years of high school vocational agriculture of students who had no work experience could provide evidence for the higher level of affective development.

14. When comparing the affective work competency development of students with the same level of participation in SOE and work experience, the following general conclusions were drawn:

    a. Students with a high level of SOE have a higher degree of affective development.

    b. There is not a significant difference in the affective development of students with low and medium levels of participation in SOE and work experience.

15. Students with a high level of SOE participation have a higher affective development than students with low, medium and high levels of work experience (unrelated to SOE) participation. The level of supervision provided by the vocational agriculture teacher for the SOE program could provide one explanation for this occurance.

RECOMMENDATION

The following recommendations are based on the results of the study and the review of literature.

1. Students should participate in SOE programs as an integral part of vocational agriculture since involvement in supervised occupational experience programs provides for the development of proper affective work competencies.

2. Participation in the FFA is recommended for vocational agriculture students since affective work competencies are positively related to FFA activities.

3. It appears that students should be encouraged to obtain some type of work experience (which is not included as part of the SOE program) if an agricultural occupational experience program is not available. since this experience is associated with the development of the affective work competencies although the extent of benefit is unclear at the present.

4. Teachers should consider using the types of SOE programs which use school facilities outside of class time and include entrepreneurial experiences for student SIE programs since there are minimally used in New York State.

5. Teachers should provide instruction on the proper work attitudes and behaviors which should be developed by vocational agriculture students.

6. Employers should be utilized as resource persons in vocational agriculture to discuss what affective work competencies they look for in their employees.

7. Work supervisors, teachers and students should meet regularly to discuss the development of affective work competencies and the technical skills of students who are involved in SOE programs.

8. Teachers and future teachers should be provided inservice and preservice courses on SOE programs. Some of the topics which should be discussed are:

   a. The importance of SOE programs.

   b The responsibilities of the teacher, work supervisor and student.

   c. How to supervise SOE programs.

   d. Planning and selecting appropriate SOE programs for students.

   e. Record keeping.

   f. The role of affective work competencies in SOE programs.

9. Agriculture teachers should consult with the school administration and school board members about supporting SOE programs in their school system. The identified importance of the SOE program provides teachers with evidence to present to the school administration for support of SOE programs.

10. Further studies on SOE in the area of affective work competency development should include:

    a. Agriculture students in grades 9, 10, 11.

    b. Other area(s) of vocational agriculture such as Agricultural Mechanization, Ornamental Horticulture, Conservation, Horse Handling and Care and Small Animal Care.

    c. Parents who are not work supervisors as part of the population to identify their perceptions on the affective development of the student.

    d. BOCES in addition to comprehensive high schools.

e. A study of the relationship between the situational factors related to SOE programs and the level of SOE participation of the students.

f. A comparison of the characteristics of the low quality SOE programs and the high quality SOE programs.

g. A study of the relationship between student characteristics and the participation levels in SOE, FFA and work experience.

h. Students who are not involved in SOE programs and compare the affective development of the students without SOE and the students with SOE.

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Table 1

FACTORS WHICH INFLUENCE SOE QUALITY BY CURRENT PRACTICE AND PERCEIVED IMPORTANCE

SOE Factor	Percent of Schools Where Factor is Currently Practiced	Mean Level of Importance*
The teacher is employed during the summer for SOE program supervision.	83.3	3.3
Appropriate SOE opportunities are made available to all agriculture students in agriculture classes including the disadvantaged and handicapped.	83.3	3.3
The teacher is provided the following for SOE program supervisory visits:		
1. A school vehicle.	58.3	3.5
2. Mileage reimbursement for use of a personal vehicle.	58.3	3.1
Participation in SOE programs is a requirement for all agriculture students in the agriculture classes.	41.7	2.8
Students are informed of the SOE program requirement before they enroll in the agriculture classes.	33.3	2.7
The teacher is provided release time from school to supervise student SOE programs:		
1. One period per day.	16.7	2.7
2. Additional release time as needed based on number of students.	33.3	2.7
Student schedules were arranged with guidance counselor(s) to accomodate the students' SOE programs	25.0	2.3
The agriculture students in agriculture classes may earn additional credit toward graduation for 300 hours of SOE beyond the agriculture requirement.	25.0	2.6
An SOE program orientation session is conducted for new guidance and administrative personnel involved with SOE programs.	0.0	2.6

*Scale: 1 = No Importance; 2 = Limited Importance; 3 = Important; 4 = Essential

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Table 2

MEAN PERCEPTIONS OF STUDENTS, TEACHERS, AND WORK SUPERVISORS IN REGARD TO THE STUDENT'S AFFECTIVE WORK COMPETENCY DEVELOPMENT BY CLUSTER AND OVERALL SCORE

Cluster	Student Mean	Student S.D.	Teacher Mean	Teacher S.D.	Work Supervisor Mean**	Work Supervisor S.D.	Significance Level
1. Ambitious	5.35	0.84	5.13	1.06	4.03	2.49	.001*
2. Cooperative/Helpful	5.20	0.90	5.02	1.13	4.09	2.53	.001*
3. Adaptable/Resourceful	5.42	0.76	5.10	1.03	4.11	2.53	.001*
4. Independent/Initiative	5.41	0.79	5.14	1.22	4.16	2.56	.001*
5. Accurate/Quality of Work	4.92	0.92	4.85	1.14	3.92	2.47	.001*
6. Pleasant/Friendly/Cheerful	5.16	0.94	5.22	1.10	3.99	2.52	.001*
7. Follows Directions/ Responsive	5.46	0.87	5.19	1.20	4.18	2.59	.001*
8. Careful/Alert/Perceptive	5.19	0.91	5.29	1.12	4.11	2.56	.001*
9. Considerate/Courteous	5.51	0.89	5.70	1.15	4.30	2.73	.001*
10. Emotionally Stable/ Judgemental/Poised	5.10	0.90	5.36	1.15	3.95	2.50	.001*
11. Perservering/Patient/ Enduring/Tolerant	5.25	0.75	5.21	1.04	4.07	2.52	.001*
12. Neat/Orderly/Personal Appearance/Manner	4.75	0.99	4.98	1.06	3.99	2.49	.001*
13. Dependable/Punctual/ Reliable/Responsible	5.67	0.82	5.24	1.11	4.15	2.58	.001*
14. Efficient/Quantity of Work/ Achieving/Speedy	4.90	0.93	4.81	0.93	3.79	2.36	.001*
15. Dedicated/Devoted/Honest/ Loyal/Conscientious	5.51	0.77	5.21	1.08	4.06	2.52	.001*
Overall AWCI Score	79.13	9.95	77.44	15.08	60.90	37.31	.001*

* Significant effect of the perceptions on the cluster at the p = .05 level.

** Significant differences exist between the means of the work supervisors and the means of the students and teachers on all of the clusters at the .05 level indicated by the Sheffe' Multiple Comparison Test.

Table 3

AFFECTIVE WORK COMPETENCY DEVELOPMENT BY LEVEL OF SOE PARTICIPATION

Cluster	Low		Medium		High		Significance
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Level
1 - Ambitious	4.14	2.21	5.06	1.64	4.78	1.69	.136
2 - Cooperative/Helpful	4.14	2.21	4.84	1.65	4.81	1.73	.317
3 - Adaptable/Resourceful	4.24	2.25	5.00	1.66	4.87	1.69	.272
4 - Independent/Initiative	4.14	2.24	4.96	1.67	4.97	1.76	.203
5 - Accurate/Quality of Work	4.13	2.25	4.77	1.63	4.49	1.65	.309
6 - Pleasant/Friendly/Cheerful	4.55	2.41	4.87	1.65	4.78	1.75	.805
7 - Follows Directions/Responsive	4.38	2.34	5.12	1.72	4.90	1.77	.299
8 - Careful/Alert/Perceptive	4.32	2.30	5.07	1.70	4.80	1.73	.265
9 - Considerate/Courteous	4.69	2.43	5.37	1.78	5.10	1.87	.357
10 - Emotionally Stable/Judgemental/ Poised	4.42	2.31	4.95	1.67	4.76	1.76	.501
11 - Perservering/Patient/Enduring/ Tolerant	4.39	2.32	4.94	1.64	4.84	1.67	.512
12 - Neat/Orderly/Personal Appearance/Manner	4.21	2.31	4.82	1.64	4.67	1.70	.439
13 - Dependable/Punctual/Reliable/ Responsible	4.40	2.28	5.23	1.74	4.96	1.75	.219
14 - Efficient/Quantity of Work/ Achieving/Speedy	4.04	2.13	4.53	1.55	4.55	1.62	.503
15 - Dedicated/Devoted/Honest/ Loyal/Conscientious	4.41	2.32	5.07	1.66	4.90	1.73	.378
Overall AWCI Score	64.58	33.71	74.58	23.98	72.19	24.66	.347

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Table 4

AFFECTIVE WORK COMPETENCY DEVELOPMENT BY LEVEL OF FFA PARTICIPATION

Cluster	None Mean	None S.D.	Low Mean	Low S.D.	Medium Mean	Medium S.D	High Mean	High S.D	Significance Level
1 - Ambitious	5.18	1.38	4.32	2.02	5.02	1.36	5.12	1.78	.036*
2 - Cooperative/Helpful	5.19	1.16	4.12[a,b]	1.96	5.07[a]	1.38	5.05[b]	1.83	.004*
3 - Adaptable/Resourceful	5.33	1.09	4.29[a]	1.98	5.14[a]	1.37	5.13	1.81	.010*
4 - Independent/Initiative	5.37	1.59	4.42	2.10	5.11	1.39	5.10	1.82	.065
5 - Accurate/Quality of Work	4.83	1.08	3.95[a,b]	1.88	4.83[a]	1.41	4.89[b]	1.81	.006*
6 - Pleasant/Friendly/Cheerful	5.78	1.14	4.25	2.04	4.95	1.43	5.09	1.78	.016*
7 - Follows Directions/ Responsive	5.17	1.30	4.36	2.08	5.19	1.44	5.25	1.87	.019*
8 - Careful/Alert/Perceptive	5.33	1.21	4.35[a]	2.03	5.04	1.42	5.22[a]	1.83	.016*
9 - Considerate/Courteous	6.00	1.19	4.74	2.24	5.36	1.46	5.31	1.98	.127
10 - Emotionally Stable/ Judgemental/Poised	6.08	0.82	4.32	2.07	4.95	1.41	5.01	1.82	.025*
11 - Perservering/Patient/ Enduring/Tolerant	5.53	1.03	4.59	2.04	4.98	1.33	5.10	1.79	.062
12 - Neat/Orderly/Personal Appearance/Manner	4.92	1.09	4.05[a,b]	1.96	4.93[a]	1.41	5.01[b]	1.77	.008*
13 - Dependable/Punctual/ Reliable/Responsible	5.67	1.26	4.59	2.16	5.14	1.39	5.27	1.86	.117
14 - Efficient/Quantity of Work/Achieving/Speedy	4.89	1.02	4.02	1.90	4.73	1.31	4.69	1.69	.040*
15 - Dedicated/Devoted/Honest/ Loyal/Conscientious	5.43	1.24	4.38	2.07	5.17	1.37	5.15	1.80	.024*
Overall AWCI Score	80.71	16.43	64.52	29.58	75.63	19.48	76.40	26.27	.020*

a,b The means of the levels of FFA participation with the same superscript differ significantly on the indicated cluster at the .05 level using the Sheffe' Multiple Comparison Test.

* - Significant effect of the level of FFA participation on the cluster at the p = .05 level.

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Table 5

AFFECTIVE WORK COMPETENCY DEVELOPMENT BY LEVEL OF WORK EXPERIENCE PARTICIPATION

Cluster	None		Low		Medium		High		Significance
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Level
1 - Ambitious	5.42[a]	1.01	4.45[a]	2.10	4.87	1.41	4.41	2.05	.025*
2 - Cooperative/Helpful	5.30[a]	1.11	4.27[a]	2.07	4.97	1.45	4.62	2.11	.030*
3 - Adaptable/Resourceful	5.41[a]	1.03	4.42[a]	2.08	4.97	1.39	4.69	2.10	.035*
4 - Independent/Initiative	5.46[a]	1.07	4.43[a]	2.14	5.13	1.45	4.53	2.07	.018*
5 - Accurate/Quality of Work	5.04	1.07	4.24	2.11	4.70	1.44	4.11	1.93	.093
6 - Pleasant/Friendly/ Cheerful	5.32	1.10	4.53	2.15	4.58	1.37	4.41	2.13	.085
7 - Follows Directions/ Responsive	5.46	1.07	4.61	2.25	4.99	1.41	4.54	2.10	.095
8 - Careful/Alert/Perceptive	5.51[a,b]	1.07	4.54[a]	2.15	4.81	1.44	4.22[b]	1.97	.009*
9 - Considerate/Courteous	5.76[a]	1.15	4.91	2.30	5.10	1.48	4.48[a]	2.22	.032*
10 - Emotionally Stable/ Judgemental/Poised	5.33	1.14	4.50	2.16	4.79	1.44	4.35	2.05	.083
11 - Persevering/Patient/ Enduring/Tolerant	5.44[a]	1.01	4.46[a]	2.08	4.72	1.31	4.55	2.08	.020*
12 - Neat/Orderly/Personal Appearance/Manner	5.19	0.97	4.32	2.13	4.75	1.45	4.39	2.06	.085
13 - Dependable/Punctual/ Reliable/Responsible	5.56	1.08	4.66	2.19	4.93	1.43	4.71	2.19	.077
14 - Efficient/Quantity of Work/Achieving/Speedy	4.79[a]	1.01	4.05[a]	1.93	4.67	1.47	4.36	1.96	.035*
15 - Dedicated/Devoted/Honest/ Loyal/Conscientious	5.43	1.05	4.59	2.15	5.02	1.41	4.50	2.09	.057
Overall AWCI Score	80.61[a]	14.44	66.99[a]	31.11	73.06	19.85	66.92	29.90	.040*

a,b The means of the levels of work experience with the same superscript differ significantly on the indicated cluster at the .05 level using the Sheffe' Multiple Comparison Test.

*- Significant effect of the level of work experience participation on the cluster at the p = .05 level.

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A COMPARISON OF NEW YORK BOCES AND CENTRAL HIGH SCHOOL TEACHER PERCEPTIONS, CONCERNING THE STATUS AND IMPORTANCE OF SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS

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The declining use of the supervised occupational experience program component of vocational agriculture has become a major concern of the agricultural education profession. A National conference on SOEP was conducted in 1982 with a follow-up conference planned for the summer of 1984. Experts, practitioner and leaders in agricultural education from a majority of the fifty states participated in the 1982 conference and are invited to the 1984 conference. The theme for each issue of the 1984 Agricultural Education Magazine focusses on some aspect of SOEP. The number of research studies on SOEP has increased dramatically in recent years. A vast majority of this research substantiates the decline in the quantity and quality of SOEP Nation wide.

Leising and Zilbert (1983) raised the question if SOEP was truly an integral part of vocational agriculture in California given the percent of students who conduct projects. Similar studies by Vaughn and Cono (1980), Long and Dunham (1982) and Penrod (1984) revealed that student participation in SOEP is much less than 100 percent in New Mexico, Utah and New York, respectively. On a regional basis Iverson and Brown (1979) found that nearly two-thirds of vocational agriculture program graduates in the southern region did not participate in SOEP. The evidence that the scope of problems associated with SOEP are Nation wide is overwhelming from a research base and from other scholarly writings.

Yet, benefits of experience programs in developing appropriate knowledge, skills, and attitudes in agriculture have been clearly stated by Phipps (1982) and Williams (1978). Deyoe (1948) described precepts concerning the importance of occupational experience in agriculture. Dewey and others outside agricultural education clearly support the principle of learning by doing. Recent research (Taylor and McMillion, 1983) found that SOEP is related to becoming established in an agricultural occupation. Affective competency development of students has been shown to be associated with SOEP (Dugan 1984). Penrod (1984) found that vocational agriculture teachers perceived major program benefits linked with SOEP.

The need to determine the status of supervised occupational experience programs and identify strategies to improve the program on a state basis was an outcome of the 1982 National SOE Conference. In New York State, Berkey and Sutphin (1983), Dugan (1983) and Penrod (1984) found student participation and the quality of student projects to be very low. Twenty-eight percent of New York Vo-Ag

students have 300 hours or more of SOEP (Berkey and Sutphin 1983). A major recommendation from this study was to initiate an inservice program to improve the quality of SOEP based on descriptive data collected from vocational agriculture teachers and their administrators. Data were collected independently from teachers and administrators on benefits of SOEP, current SOEP practices and perceived importance of factors associated with SOEP.

The Berkey and Sutphin (1983) study did not attempt to analyze differences within the population of agriculture teachers concerning perceived SOEP benefits, current practices and the importance of related program factors. New York Vocational Agriculture delivery systems are primarily through Central schools and vocational centers (BOCES) operated jointly by two or more school districts. The teaching environments in these two types of systems are very different. However, Farm Production and Management is the major specialization taught in both settings.

In order to design an inservice program on SOEP a study was needed to determine the extent teachers in BOCES and Central Schools were different on selected variables. Hence, this paper will build on the earlier study by Berkey and Sutphin (1983).

OBJECTIVE OF THE STUDY

The purpose of this study was to identify and describe differences among agricultural education programs with respect to SOEP in order to provide the basis for establishing an inservice and preservice SOEP program which can adequately meet the needs of BOCES and Central School teachers.

The specific objectives of the study were to:

1. Describe selected characteristics of vocational agriculture teachers, their school and agriculture programs which are associated with supervised occupational experience programs.

2. Describe and determine if differences exist in the perceptions of vocational agriculture teachers in BOCES and Central Schools with regard to (a) benefits of SOEP, (b) current SOEP practices and (c) the importance of selected SOEP factors.

3. Describe and determine if differences exist between Central School Farm Production and Management (FPM) teachers with regard to (a) benefits of SOEP, (b) current SOEP practices and (c) the importance of selected SOEP factors by levels of:

a. teaching experience
b. SOEP college instruction
c. Teacher former participation in SOEP when enrolled in high school (yes, no)
d. Teacher perceived need for additional SOEP competence

PROCEDURE

Population and Sample

The population for this study was 333 New York vocational agriculture teachers. The list of agriculture teachers was taken from the 1982-83 New York State Directory of Agriculture Programs and Teachers compiled by the State Education Department. Names were validated by four individuals from state education, teacher education and the Cornell Instructional Materials Service to determine that position listings were correct. The population of agriculture teachers was sampled yielding a response rate of 61 percent.

Data Collection

A mailed questionnaire was used to collect data on the following areas: (a) type of school; (b) teacher background in vocational agriculture, teaching experience and certification status; (c) type and scope of school laboratory facilities; (d) percentage of students in FFA; (e) type and scope of SOEP conducted; (f) teacher attitude toward the value of benefits of SOEP; and (g) current practice and importance regarding SOEP factors. The current practice section asked for a "yes" or "no" response. The importance and benefits were determined by response to a likert type scale. In the case of demographics and background information, nominal level data were collected. The rating scales were treated as interval level data.

The quality of the instrument was assertained by validity and reliability checks. Content validity for the instrument was determined through review by a panel of experts. Reliability was established by a Cronbach's Alpha coefficient of .85 and .89 for two separate sections of the instrument.

Questionnaires were mailed to all members of the population of New York agriculture teachers established as the frame for this study. Included with the questionnaire was a cover letter appealing to the respondent's loyalty to the agricultural education profession and a promise for anonymity regarding their response. Yellow colored paper was used to improve the response rate. Two separate follow-up letters were mailed to respondents at two week intervals after the initial mailing. Additional follow-up seemed unlikely to produce a higher response rate. Hence, data collect was terminated at a 61 percent response rate.

A follow-up of non-respondents was conducted to determine if the group differed from respondents and, thus, limiting generalization of the results. Non-respondents were found to differ on one or more of the characteristics: (1) considered their course to be avocational or science, (2) did not have SOEP and/or (3) were located in the New York City area. The findings, conclusions and recommendations of this research must be interpreted and generalized in consideration of these non-respondent differences.

Data Analysis

The Statistical Package for the Social Sciences was used as the computer program to analyze data. Descriptive statistics were used to analyze demographic and background data. Inferential statistics were used to determine significant differences. Oliver and Hinkle (1981) and Darlington (1984) suggested that when the total population is surveyed, inferential statistics are appropriate if the sample is viewed as a sample of a larger population or a representative sample of students (programs) over a period of time. In the present study there is rational to accept the later case based on Cornell surveys to identify student teaching centers and research projects during the past three years which indicated similar situations concerning SOEP. The SOEP situation appears unlikely to change in the near future unless intervening actions directly or indirectly impact on the program.

FINDINGS

Teacher Characteristics

Over one-half (53.5%) of teachers responding taught farm production and management. The other specializations were represented in the approximate percentage that they represented of the total number of teachers in New York State. This amounted to approximately 16, 14 and 10 percent of the total number of programs for ornamental horticulture, agricultural mechanization and conservation, respectively. Small animal care, horse handling and care, and applied agricultural science and mechanics accounted for less than seven percent collectively.

Forty-eight percent of the respondents were enrolled in high school vo-ag programs when they were students. FFA membership and participation in SOEP among teachers with high school vocational agriculture experience was 96 and 80 percent, respectively. Of the 202 respondents, 46 percent had high school FFA experience and 38 percent conducted on SOEP.

The highest percent of teachers have five years or less teaching experience in comparision with other teachers grouped by four year intervals. The percent substantially drops to 10 percent at six to nine years experience, but increases to 20 percent for each of the categories 10 to 14 and 15 to 19. Thirteen percent of the teachers have 20 or more years of teaching experience. The percent of teachers who have experience in their present school fluctuates only two to three percent from the data reported for career experience except for the 20 year (plus) category. Nineteen percent of the respondents have 20 years or more experience at one school.

In terms of college work related to SOEP, 18.3 percent of teachers had a college course on SOEP plus a course including SOEP. Of the remaining teachers, 40.1 percent had only a course including SOEP, 36.6 percent reported having no college course on SOEP, and five percent did not respond to the question. In summary, more than one teacher in three had taken no college instruction on conducting SOEP.

Three-quarters (74.8%) of teachers responding had permanent certification. Of the remainder, 20.3% had provisional certification, 3.5% held a certificate of default, and 1.5% did not respond to the question.

Program Characteristics

School shops and land laboratories are the most prominent type of laboratory facility which are found in 88 and 58 percent of schools, respectively. Greenhouse (33.7 percent), Forestry plots (30 percent) and Nursery (eight percent) are the next most frequently occurring facilities. Less than five percent of schools have small or large animal care laboratories. Infrequently reported facilities include private and rented facilities, saw mills and maple syrup operations.

More than one teacher in six (17.3 percent) reported having no students enrolled in FFA. Similarly, 16.8 percent reported less than 50 percent FFA membership. Almost one-half of teachers (46 percent) reported 100 percent FFA membership and the balance (20.4 percent) reported membership between 51% and 99%.

SOEP Characteristics

Approximately one-fourth of the teachers had a written SOEP policy. Of this number 87 percent were approved by the school administration.

Table 1 depicts SOEP participation by students and program in grade levels nine through 12. An average of 73.5 percent of all programs used SOEP with the greatest frequency of occurrence (92 percent) in grade 11. The percent of student participation does not correspond to program participation. Student participation in grades nine and 10 (47 percent for each) is higher than in grades 11 and 12. Approximately 32 percent of the total students in each of grades nine and 10, complete 300 or more hours of SOEP. Thus, student participation dropped in higher grade levels while program participation increased.

Table 1

Student SOEP Status
By Grade Level

Grade Level	Total Students in Class	Programs with SOEP		Students with SOEP		Students Completing 300+ Hours	
	F	F	%	F	%	F	%
Nine	1685	105	52	799	47.4	535	31.8
Ten	1656	124	61.4	772	46.6	518	31.3
Eleven	2382	186	92.1	761	31.9	547	23.0
Twelve	1897	181	89.6	644	43.9	504	26.6
Total	7620	597	73.5[a]	2976[a]	39.1[a]	2104	27.6[a]

F = Frequency
a = average percent

A little over one-half (51 percent) of students receive supervisory visits from their agriculture instructor, five percent from another agriculture instructor, 14 percent from a co-op work supervisor and 23 percent receive no supervisory visits at all. Fifty-six percent of students receive a supervisory visit concerning

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their occupational experience program during the school year and 43 percent during the summer. Approximately one-half of students who are visited receive one visit.

Teachers reported that 31 percent of their students live more than 21 miles from school, 34 percent live within 10 miles and 35 percent live between 11 and 20 miles from the school.

Approximately one-half of vocational agriculture teachers teach the relationship between FFA and SOEP and record keeping in class. Selecting an SOEP and Planning SOEP units are taught by approximately one-third of respondents. Summary and analysis of SOEP records is taught by only 22 percent of the teachers. Thirty-three percent of respondents did not indicate teaching any units of instruction on SOEP. Similarly, 31 percent of the respondents did not use record books. Of those who used record books 48 percent use the New York record book, while 13 percent selected another type.

The percent of class grade on SOEP was reported between one and five and six and 10 by 12 percent and 15 percent of teachers, respectively. Six percent of the respondents counted SOEP as more than 21 percent of the students total grade while 42 percent did not grade SOEP.

An annual summary of SOEP was completed by only 5.9 percent of teachers. Of the remainder, 84.7 percent responded that they had not made a compilation of student SOEP activities and 9.4 percent did not respond. All teachers who compiled an annual summary filed such with their school administration.

Teacher Competence in SOEP

Teachers were asked to assess their need for additional competence in SOEP. One-half of the teachers indicated a "High or Medium need" for additional competence in SOEP. Approximately one-third (36.1 percent) reported "Low or No need", and 13.9 percent did not respond.

Comparison of BOCES and Central School Teachers

Less than 25 percent of BOCES teachers are practicing eight of the 12 factors associated with high quality SOEP investigated in this study. Of the remaining four factors, none were practices by more than 48 percent of the BOCES teachers. In comparison less than 25 percent of Central School teachers practice five of the 12 factors studied. Four factors were practiced by more than 50 percent of Central School teachers. Providing SOEP opportunities for the disadvantaged and handicapped were practiced by a higher percent of teachers (73.6 percent of Central School teachers) than any other practice.

The Chi Square statistic was used to determine if the current SOEP practices of BOCES teachers and Central School teachers were significantly different at the .05 alpha level. Significant differences were found to exist on seven of twelve practices as indicated in Table 2. Of the seven practices found to be significant, five were significant at the .01 level. In all cases the percent of teachers from their respective areas had fewer practices related to quality SOEP at BOCES than in Central Schools. Practices which were significantly different between BOCES and Central Schools were related to requiring SOEP, access to a school vehicle, summer employment, SOEP opportunities for the disadvantaged and handicapped and using SOEP as credit toward graduation. In-school time for supervision, coordination with guidance counselors and administrators, and SOEP summarization were reported below the 40 percent level for both BOCES and Central School teachers with no significant difference (.05 alpha) between the two types of teachers.

Central School teachers rated nine of twelve SOEP factors more important than BOCES teachers with respect to their importance in maintaining a high quality SOEP. Of the remaining three factors, ratings were the same for two factors and .01 higher on one factor. The highest rated items by Central School teachers were summer employment for supervision of SOEP (3.42), providing SOEP opportunities to the disadvantaged and handicapped (3.18) and mileage reimbursement for supervisory travel (3.18). Similarly, BOCES teachers rated SOEP opportunities for the disadvantaged and handicapped, coordination with guidance counselors and mileage reimbursement for supervisory visits highest with mean scores of 2.94, 2.84 and 2.83, respectively. Four factors rated lower than others by both Central School (below 2.7) and BOCES (below 2.5) teachers include the awarding of SOEP credit toward graduation, requiring SOEP of all students, and providing one or more class periods for supervision.

Significant differences between BOCES and Central School teachers were observed at the .05 alpha level for requiring SOEP for all students, informing students of the SOEP requirement prior to enrollment in agriculture, providing SOEP opportunities to the handicapped and disadvantaged; and at the .01 alpha level for mileage reimbursement for supervision and summer employment for supervision. Table 2 portrays mean scores, standard deviation and factors found to be significant using T test statistics.

BOCES and Central School teachers rated four items concerning the benefits of SOEP on a five point Likert scale (1 = strongly disagree to 5 = strongly agree). Three statements were rated from 4.1 to 4.3 by BOCES and Central School teachers concerning the value

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Table 2

BOCES and Central School Teachers Responses to Current Practice and Importance of Factors Related to SOEP

Factor		Current Practice Yes%	Current Practice No%	n	Importance $\bar{x}$	Importance S.D.	n	T-Value
Participation in SOEP is a requirement for all agriculture students	C	19.9	80.1[b]	171	2.7	.902	155	2.11[a]
	B	7.4	92.6	122	2.5	.707	106	
Students are informed of the SOEP requirement before they enroll in agriculture	C	42.2	57.8[b]	161	2.8	.87	150	2.32[a]
	B	20.3	74.7	118	2.6	.86	101	
One class period is provided to the teacher for supervision	C	10.2	89.8	166	2.67	.99	147	1.15
	B	9.7	90.3	113	2.52	1.01	95	
More than one period is provided for SOEP supervision when justified by enrollment	C	20.1	79.9	154	2.55	.96	137	.22
	B	19.0	81.0	116	2.52	.97	100	
A school vehicle is provided for supervision	C	55.5	44.8[a]	165	2.88	.93	147	1.31
	B	40.2	59.8	117	2.72	.91	96	
Mileage reimbursement is provided for SOEP supervision travel	C	59.6	40.4[a]	156	3.18	.83	138	2.99[b]
	B	44.7	55.3	114	2.83	.95	93	
Summer employment is provided for SOEP supervision	C	65.9	34.1[b]	170	3.42	.805	150	6.53[b]
	B	15.0	85.0	120	2.63	1.61	93	
SOEP opportunities are provided to all students including the disadvantaged and handicapped	C	73.6	26.4[b]	163	3.18	.701	152	2.52[a]
	B	47.7	52.3	111	2.94	.777	96	
Coordination with guidance counselor to accommodate student student SOEP	C	37.7	62.3	167	2.83	.865	150	-0.07
	B	39.1	60.9	115	2.84	.885	91	
Additional credit toward graduation to be given to students who have more than 300 hours SOEP each year	C	28.3	71.7[b]	166	2.61	.93	145	1.79
	B	13.2	86.8	114	2.39	.921	93	
New guidance or administrative personnel are oriented on SOEP	C	13.3	86.7	165	2.77	.855	146	-0.06
	B	14.8	85.2	115	2.77	.898	93	
Annual SOEP review/report is conducted	C	22.1	77.9	154	2.75	.841	136	0.000
	B	21.6	78.4	111	2.75	.847	92	

C=Central High School Teacher; B=BOCES Teacher; a=Significant .05 alpha; b=Significant .01 alpha
d=Importance was rated on a 4 point likert scale; 1=Not Important; 2=Limited Importance; 3=Important; 4= Essential

of SOEP for developing favorable student work attitudes, values and habits; technical skill and knowledge development; and benefits accrued to the vo-ag program, school and community as a result of SOEP. The benefit concerning the need for SOEP in order to have a high quality program was rated 3.69 by BOCES teachers and 4.19 by Central School teachers. Central School teachers rated all items higher than BOCES teachers with significant differences for the items SOEP develops favorable work attitudes, values and habits (.03 alpha) and SOEP is needed for a quality vo-ag program (.0000 alpha).

Description of Farm Production and Management Teachers' Perceptions on Benefits, Importance of SOEP Factors and Current Practices

The subset of FPM teachers was selected from the sample of BOCES and Central School teachers to determine differences within the group on current practices, perceived importance of SOEP factors, and benefits of SOEP on selected variables. Other specializations were not taught in sufficient quantities in BOCES and Central Schools to permit data analysis.

Teachers were asked to rate their perceived need for additional competence on a four point likert scale (1 = No Need; 4 = High Need) in order to conduct high quality SOEP. Chi Square statistic indicated no significant difference (.05 alpha) among levels of perceived need for additonal competence and whether SOEP factors were currently practiced (yes or no) for all 12 factors. An ANOVA Test revealed no significant difference (.05 alpha) among levels of perceived need for additional competency and the importance of each of the 12 SOEP factors. Likewise, no significant differences (.05 alph) were found to exist among levels of perceived need for additional competence and perceived benefits of SOE as indicated by ratings on four benefit statements.

ANOVA and Chi Square tests were used to determine if FPM teachers who had experience with SOEP when they were in high school differed significantly at the .05 alpha level from those who had no experience with SOEP in their high school career on the dependent variables "current SOEP practices", "importance of SOEP factors" and "benefits associated with SOEP". No signifcant differences between the two groups were found for any of the dependent variables.

FPM teachers rated their extent of college course work on SOEP by the categories "Completed a course on SOEP", "Complete a course which included SOEP instruction", and "Have had no course work on SOEP". An ANOVA and Chi Square statistics were used to determine if significant differences exist among levels of college course work on SOEP and current teacher SOEP practices, importance of SOEP factors and perceived benefits of SOEP. No significant differences at the .05 alpha level were determined to exist between the independent variable and dependent variables.

Data were categorized for years of vocational agriculture teaching experience by 0-5, 6-9, 10-14, 15-19 and 20 years or more. Chi Square statistics was used to determine if there were significant differences among the five categories of teachers with regard to their current SOEP practices. No significant differences were found in the 12 practices at the .05 alpha level. ANOVA was used to identify significant differences among teachers grouped by experience with regard to their perceptions on the importance of SOEP factors associated with high quality experience programs and perceived benefits of SOEP. No significant differences (.05 alpha) were found for the importance of SOEP factors or perceived benefits.

CONCLUSIONS

1. The majority of teachers do not have high school FFA and SOEP background and must depend heavily on teacher training programs to provide them with appropriate knowledge, skills and attitudes to conduct SOEP programs during the first few years of teaching.

2. A high percentage of teachers have less than five years experience in teaching.

3. College preservice and inservice programs fail to reach 40 percent of agricultural instructors with a credit bearing course which includes at least some instruction on SOEP.

4. School laboratories, especially land labs, are available in many schools which could be used for SOEP.

5. New York agriculture teachers are not teaching units of instruction on SOEP in sufficient scope to give students the knowledge, skills and attitudes needed to participate in a high quality occupational experience program.

6. Record books are not provided to many students for conducting SOEP.

7. The supervision of occupational experience programs by agriculture teachers is inadequate to maintain a high quality program.

8. Central School and BOCES teachers are significantly different with regard to a majority of the current practices associated with high quality SOEP; with fewer practices found in the BOCES setting than Central Schools in all cases.

9. Current practices in Central School and BOCES match teachers' perceived importance of these practices with regard to conducting a high quality SOEP.

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10. Summer employment for SOEP supervision, providing SOEP opportunities for the disadvantaged and handicapped and mileage reimbursement for SOEP travel are regarded as important factors for high quality SOEP by both Central School and BOCES teachers.

11. Credit toward graduation, SOEP requirement for all students and teacher release time from one or more class periods for supervision was regarded less important for high quality SOEP than other factors.

12. Situations exist in BOCES which result in fewer current practices and perceived lower level of importance of these factors than in Central Schools.

13. BOCES teachers are relatively uncertain as to whether SOEP is necessary for a quality vocational agriculture program, yet are committed to the benefits of SOEP to the school, community and the student in terms of developing knowledge, skills, and proper work attitudes, values and habits. Part of the perception could be explained by the high level of opportunity for experiential learning on extensive school owned laboratories and equipment available at BOCES.

14. Major policy changes are needed in Central Schools and BOCES to encourage and facilitate SOEP such as release time from classes for SOEP supervision, use of a school vehicle or mileage reimbursement for supervision of SOEP and summer employment of teachers for SOEP supervision.

15. The levels of perceived need for additional SOEP competence, years of teaching experience, amount of college instruction on SOEP and prior experience with SOEP as a high school student are not significantly related to current SOEP practices, perception on the importance of SOE factors or perceived benefits of SOEP among New York FPM teachers in BOCES and Central Schools. Hence, the impact of other factors, such as school policy and situational factors are greater than teacher experience, or need for training.

RECOMMENDATIONS

1. Strategies need to be identified to change policies in BOCES and Central Schools to provide supervision time on SOEP during the school day, mileage reimbursement or a school vehicle for supervision and extended employment for supervision of SOEP during the summer. Agriculture teachers would, then, be in a better position to require SOEP, communicate this requirement to students prior to their enrollment in agricultural

education, consider SOEP as part of a students grade toward receiving graduation units/credits, coordinate with guidance and administrative personnel concerning SOEP, and keep accurate records of SOEP. State level legislation, directives/policy within the state education department, and/or local policy changes influenced by the agriculture teacher's assocation, joint staff and/or local teachers are potential sources for change.

2. Additional research is needed to explore variables not investigated in this study which will identify critical factors inhibiting high quality SOEP.

3. Since many teachers have five years or less teaching experience and may not have extensively studied SOEP in college, assistance from teachers experienced with SOEP or by the agriculture teacher's association would be helpful.

4. Alternative models and particularly the use of school facilities for occupational experience programs should be explored and utilized in BOCES.

5. Inservice and preservice programs on SOEP should be developed to address policy guidelines and strategies needed to support SOEP.

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AN ANALYSIS OF RESEARCH METHODOLOGY USED IN AGRICULTURAL EDUCATION, 1974-1982

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INTRODUCTION

The initiation, establishment, and progress of any educational effort depends largely on the quality and quantity of the research and development base that supports it. The agricultural education profession has a long history and tradition of research and development support. The profession has always depended on research to chart its course. Summaries of research completed have been compiled since the early days of the profession (1935).

In recent years, however, concern has been expressed regarding the type of research being conducted and its impact. Periodically, professionals in agricultural education have questioned whether or not the type of research being conducted is meeting the needs of the profession and charting the path for further program development. Krebs, (1976) speaking at the Thirtieth Annual Central Region Research Conference in Agricultural Education, observed that others outside the field of agricultural education characterize agricultural education research, among other things, as being "dominated by surveys."

Earlier, professionals in agricultural education were taking positive steps toward improving the visibility, status and quality of research conducted. In 1974, the First Annual National Agricultural Education Research Meeting was held in New Orleans, Louisiana. In December, 1983, the Tenth Annual Research Meeting was held. Attendance at the 1983 meeting was more than five times the number present at the first national meeting. During the ten year time period, efforts were made to increase the quantity of research conducted, to increase the quality of research reported, and in more recent years, to include a research training session as part of the meeting.

Others, too, have attempted to increase the effectiveness and impact of agricultural education research. Stewart, Shinn, and Richardson, (1976, 1977) involved the profession in identifying the "concerns" of the profession. It was hoped that by identifying the professional concerns of agricultural educators, research could be focussed to answer questions regarding the concerns. Mannebach, (1978, 1980) conducted an analysis of the impact of agricultural education research on identified professional concerns. He concluded that 28 percent of the studies reported from 1974-1977 were "non-applicable" to the professional concerns identified; 25 percent had

implications for the first priority concern, curriculum development; and that 52 percent of the studies reported had impact on the first five areas of priority concern identified.

McCracken (1982) writing in the Encyclopedia of Educational Research, reviewed eighty reports of research. He identified seven research issues and areas that have been of concern to the profession. He also identified several areas of research requiring further study in his synthesis and interpretation report.

In another study, McCracken, (1982) reviewed 61 research studies in agricultural education. From his analysis, four studies were selected as exemplary. Included were an experimental study exhibiting an exemplary procedure for establishing the creditability of instruments, a quasi-experimental study on teacher effectiveness, a philosophically sound follow-up study, and a developmental study that has had great impact upon the practice of college teaching.

Each of these efforts has been conducted to increase the effectiveness and quality of agricultural education research. Research in agricultural education has been and continues to be a concern of the profession. However, heretofore, no study has been conducted to analyze the research methodology used in agricultural education. Is the observation by others as perceived by Krebs that agricultural education research is being dominated by surveys valid? What type of research is being conducted by the agricultural education profession? What research methods are being used? These and other questions regarding the issue of research methodology used in agricultural education are the chief concerns of this study.

OBJECTIVES OF THE STUDY

The primary purpose of the study was to analyze the research methodology used in agricultural education studies completed and reported in the annual national Summaries of Research and Development Activities in Agricultural Education. More specifically, the objectives of the study were:

1. To determine the broad trends in agricultural education research.
2. To examine the extent to which reported research in agricultrual education has increased during the time period studied.
3. To determine the trends regarding the number of masters, doctoral and staff studies completed during the time period.
4. To identify by region and by institution where the majority of reported agricultural education research is being conducted.
5. To determine whether or not the data were collected in a foreign country.
6. To classify the research reported as historical, descriptive or experimental as classified by Van Dalen (1966).
7. To identify the primary manner in which the data were collected.
8. To identify the extent to which various statistical analysis tests and techniques were used and reported.

METHOD

The primary method used in the study was document analysis. Abstracts of research conducted and reported in the annual national Summaries of Research and Development Activities in Agricultural Education were read by two graduate research assistants. Eight annual national summaries, from 1974-75 to 1981-82, were included in the study. Pertinent data and information related to the objectives specified in the study were identified and coded on summary data sheets. The research summaries reported were classified as historical, descriptive or experimental according to criteria specified by Van Dalen (1966). Categories of other data collected were identified by the authors.

A sample of the studies read, classified, and coded by the graduate research assistants was checked for reliability of classification and coding by other professional vocational education personnel. In addition, further reliability checks were made by having both graduate students read a sample of the same research summaries and comparing results. No statistical reliability tests were conducted.

The summary data sheets were then re-coded for data analysis. The data were analyzed by using techniques identified in the Statistical Package for the Social Sciences (1970). Frequencies, ranges, and percentages were analyzed and reported.

The data sources used in the study were the research abstracts reported in the eight annual Summaries of Research and Development Activities in Agricultural Education, 1974-1982. No attempt was made to identify or analyze agricultural education studies not reported in the Summaries.

FINDINGS

A summary of results regarding the objectives of the study will be presented in this section.

As shown by the data in Table I, the number of studies reported has almost tripled since the summaries were compiled on a national basis in 1974-75. The largest number of studies reported was 181 in the 1979-80 year. The number was 15.7 percent of the total studies reviewed.

The number of studies reported seems to have reached a plateau since that time.

TABLE 1

NUMBER AND PERCENTAGE OF AGRICULTURAL EDUCATION STUDIES REPORTED BY YEAR, 1974-1982

Year	Studies Reported Number	Percent
1974-75	54	4.7
1975-76	168	14.6
1976-77	121	10.5
1977-78	141	12.3
1978-79	165	14.3
1979-80	181	15.7
1980-81	169	14.7
1981-82	151	13.1
TOTAL	1150	100.0

Data in Table 2 show the number and percentage of masters, doctoral, and staff studies reported in agricultural education from 1974-1982. As can be seen by the data, a total of 558, or 48.5 percent of the studies reported were masters studies. Doctoral studies comprised almost 30 percent of the studies reported while 250, or 21.7 percent of the studies reported were staff studies. An undergraduate honors thesis was the other study included.

TABLE 2

NUMBER AND PERCENT OF MASTERS, DOCTORAL AND STAFF STUDIES REPORTED IN AGRICULTURAL EDUCATION, 1974-1982

Level of Study	Studies Reported Number	Percent
Masters	558	48.5
Doctoral	341	29.7
Staff	250	21.7
Other	1	.1
TOTAL	1150	100.0

Data in Table 3 show the number and percentage of studies reported by region, 1974-1982. The central region reported the greatest number of studies, 497, or 43.2 percent.

TABLE 3

NUMBER AND PERCENTAGE OF STUDIES REPORTED BY REGION IN AGRICULTURAL EDUCATION, 1974-1982

Region	Studies Reported	
	Number	Percent
Western	135	11.8
Central	497	43.2
Southern	296	25.7
Eastern	219	19.0
TOTAL	1147	99.7

The southern region reported 25.7 percent of the research while the eastern and western regions reported 19.0 and 11.8 percent of the research respectively. The institutions in states reporting agricultural education research were classified into regional designations as specified by Moore (1982) in the constitution and by-laws of the American Association of Teacher Educators in Agriculture.

A total of 96 institutions having teacher education programs in agriculture were included in the study. The 1983-84 Directory of Agricultural Teacher Educators distributed by the U.S. Department of Education, Washington, D.C. was the source of the institutions included. Fifty of the 96, or 52 percent of the institutions reported research during the eight year period. Data in Table 4 show the number, percentage and cumulative percentage of research studies reported by the eleven institutions having conducted the largest number of research studies over the eight year period. The top eleven ranking institutions by quantity of research reported are listed in Table 4.

As can be seen from the data presented, three institutions, Ohio State, Oklahoma State and Pennsylvania State reported 35.6 percent, or over one-third of the research reported. Over half of the research reported is conducted by six institutions while two-thirds of the research reported in agricultural education is conducted by eleven institutions. The range of studies reported was from 0, 46 or 48 percent of the institutions reporting to 172, the number of studies conducted at the Ohio State University.

TABLE 4

RANK ORDER OF THE
ELEVEN INSTITUTIONS REPORTING THE
LARGEST NUMBER OF RESEARCH STUDIES,
1974-1982

Rank Order	Institutions	Studies Reported		
		Number	Percent	Cumulative Percent
1	Ohio State University	172	15.0	15.0
2	Oklahoma State University	133	11.6	26.6
3	Pennsylvania State University	104	9.0	35.6
4	Iowa State University	89	7.7	43.3
5	University of Minnesota	55	4.8	48.1
6	Purdue University	41	3.6	51.7
7	West Virginia University	40	3.5	55.2
8	Cornell University	38	3.3	58.5
9	University of Arizona	37	3.2	61.7
10.5	University of Missouri	35	3.0	64.7
10.5	Virginia Polytechnic and State University	35	3.0	67.7
	TOTAL	779	67.7	

A question of whether or not the research reported was funded or not was raised in the study. By reading the summaries reported, it was determined that less than one percent clearly stated that they were funded. The majority of research in agricultural education is not reported as being funded. In most cases, the source of funding, if any, was not identified.

Another objective of the study was to determine whether or not the data were collected in a foreign country. Studies which indicated that the data were collected in a country outside of the United States of America were classified as foreign studies. Almost nine percent of the studies were foreign while data in over 91 percent of the cases were collected in the United States. These studies were classified as being domestic studies.

A breakdown of the types of research studies reported can be found in Table 5. As can be seen from the data presented, a total of 1035 studies, or 90 percent of the studies reported were descriptive studies. A total of 107 studies, or 9.3 percent were experimental while 8, or .7 percent, were historical studies.

TABLE 5

NUMBER AND PERCENTAGE OF HISTORICAL, DESCRIPTIVE AND EXPERIMENTAL RESEARCH STUDIES REPORTED IN AGRICULTURAL EDUCATION, 1974-1982

Type of Study	Studies Reported	
	Number	Percent
Historical	8	0.7
Descriptive	1035	90.0
Experimental	107	9.3
TOTAL	1150	100.0

A description of the number and percent of historical, descriptive, and experimental research reported by level is shown in Table 6. A total of 44.5 percent of the masters studies, 25.5 percent of the doctoral studies and 20.0 percent of the staff studies were judged to be descriptive in nature, while 3.7 percent of the masters studies, 4.1 percent of the doctoral studies and 1.6 percent of the staff studies were experimental. Historical studies accounted for less than one percent of the research conducted.

TABLE 6

NUMBER AND PERCENTAGE OF MASTERS, DOCTORAL, AND STAFF STUDIES REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Level of Study	Type of Study							
	Historical		Descriptive		Experimental		TOTAL	
	Number	%	Number	%	Number	%	Number	%
Masters	5	0.4	511	44.5	42	3.7	558	48.6
Doctoral	1	0.1	293	25.5	47	4.1	341	29.7
Staff	2	0.2	230	20.0	18	1.6	250	21.8
TOTAL	8	0.7	1034	90.0	107	9.4	1149	100.0

The descriptive research studies reported are analyzed regarding whether they were survey, interrelationship or developmental studies. Overall, a total of 45 percent of the studies were classified as survey studies. The number and percentage of surveys reported by type can be found in Table 7. School surveys were the dominant type of survey used with a total of 302, or 26.3 being reported. Job analysis, 7.0 percent; documentary analysis, 4.8 percent; public opinion, 3.1 percent; and community surveys, 3.7 percent comprised the remaining types of surveys used. A total of 633, or 55 percent of the studies classified were judged as not having the survey as the major classification of descriptive research reported.

TABLE 7

NUMBER AND PERCENTAGE OF SURVEY RESEARCH STUDIES REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Type of Survey	Studies Reported	
	Number	Percent
School	302	26.3
Job Analysis	81	7.0
Documentary Analysis	55	4.8
Public Opinion	36	3.1
Community	43	3.7
Not a Survey	633	55.0
TOTAL	1150	100.0

Data in Table 8 show the number and percentage of interrelationship studies reported by type. Overall, 13 percent of the studies were classified as interrelationship studies. Causal comparative studies comprised 8.1 percent, correlational studies made up 4.2 percent and case studies comprised less than one percent of the interrelationship studies reported.

TABLE 8

NUMBER AND PERCENTAGE OF INTERRELATIONSHIP STUDIES REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Type of Interrelationship Study	Studies Reported	
	Number	Percent
Case Study	9	0.8
Causal Comparative	93	8.1
Correlational	48	4.2
Not an Interrelationship Study	1000	87.0
TOTAL	1150	100.0

The third type of descriptive research classified by Van Dalen was developmental. Developmental studies comprised less than five percent of the research reported. A total of 51 studies were classified as being developmental studies; 40 or 3.5 percent were growth studies while 11 or one percent were trend studies. The data are presented in Table 9.

TABLE 9

NUMBER AND PERCENTAGE OF DEVELOPMENTAL STUDIES REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Type of Developmental Study	Studies Reported	
	Number	Percent
Growth	40	3.5
Trend	11	1.0
Not a Developmental Study	1099	95.6
TOTAL	1150	100.0

Another objective of the study was to determine the primary manner in which the data in agricultural education research were collected. Four methods of data collection as specified by Van Dalen were studied. Data collection methods used were questionnaires, interviews, appraisal instruments, and observation.

Data in Table 10 show the number and percentage of studies reporting the four primary data collection procedures used. The number and percentage of techniques used in sub-categories under the major data collection procedures reported are also shown.

As can be seen from the data, a total of 626, or 54.4 percent, of the studies reported that questionnaires were used to collect data. Very little data was revealed regarding the type of questionnaire used. The mailed questionnaire was reported used by 3.6 percent of the researchers, direct contact by .5 percent, a closed form questionnaire by 1.5 percent and an open ended questionnaire by .4 percent of the respondents. The questionnaire was the primary procedure reported as being used to collect data in the agricultural education resarch studies reported.

A total of 165, or 14.3 percent, of the studies indicated that the interview was used to collect data. The individual interview was used in 10.9 percent of the cases while the group interview was used 1.8 percent of the time. Structured and unstructured interview procedures were reported as being used .3 and .1 percent of the time respectively.

The use of an appraisal instrument was reported by 214, or 18.6 percent of the researchers submitting abstracts for inclusion in the Summaries. Scales, 8.2 percent; tests, 7.3 percent; and inventories, 2.3 percent; were the primary appraisal instruments used. Sociometric techniques, .6 percent, and projective techniques, .2 percent were the least used appraisal instruments.

TABLE 10

NUMBER AND PERCENT OF DATA COLLECTION METHODS REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Data Collection Procedure Used	Studies Reported Number		Percent	
Questionnaire	626		54.4	
-Direct Contact		5		.5
-Mailed		41		3.6
-Closed Form		18		1.5
-Open Form		4		.4
Interview	165		14.3	
-Individual		125		10.9
-Group		21		1.8
-Structured		3		.3
-Unstructured		1		.1
Appraisal Instrument	214		18.6	
-Test		84		7.3
-Inventory		27		2.3
-Scale		94		8.2
-Sociometric Technique		7		.6
-Projective Technique		2		.2
Observation	43		3.7	
-Checklists and Schedules		2		.2
-Time Sampling		10		.9
-Behavioral Diaries/Anectdotal Records		2		.2
-Mechanical Instruments		16		1.4
TOTAL	1048		91.0	

A total of 43, or 3.7 percent, of the studies reported that observation techniques were used to collect the data. Mechanical instruments, 1.4 percent; time sampling .9 percent; checklists and schedules, .2 percent; and behavioral diaries and anectdotal records, .2 percent comprised the specific observation techniques reported.

The last objective of the study was to determine the extent to which various statistical analysis techniques or tests were used and reported. Data regarding the whether or not statistical analysis techniques or tests were reported in the Summaries as shown on Table 11. As shown by the data in Table 11, a total of 378, or 32.9 percent, of the studies reported the statistical test or technique used. In two-thirds of the cases, it was impossible to determine the statistical techniques or test used, if any, by reading the abstract reported in the Summaries.

TABLE 11

NUMBER AND PERCENT OF STUDIES REPORTING THE TYPE OF STATISTIC USED IN AGRICULTURAL EDUCATION RESEARCH, 1974-1982

Statistical Test or Technique Reported	Studies Reported	
	Number	Percent
Yes	378	32.9
No	772	67.1
TOTAL	1150	100.0

Data in Table 12 show the number of masters, doctoral and staff studies reporting the use of various statistical tests and techniques. A higher percentage of doctoral studies reported the use of statistical tests and techniques than did masters or staff studies. The statistics reported most often for masters studies were percentages, means, analysis of variance, t-tests and frequency distributions. The analysis of variance, means, percentages, chi square, and t-tests were reported most often in doctoral studies while percentages and the analysis of variance were most prevelant in staff studies. Other statistical tests or techniques reported in the research but not shown in Table 12 because of the small number of cases reported were Duncan's Multiple Range Test, Fisher's LSD, The Gutman Scale, Kruskal-Walls Test, post-hoc tests, Q techniques, and Tukey's WDS.

TABLE 12

NUMBER OF MASTERS, DOCTORAL AND STAFF STUDIES REPORTING THE USE OF VARIOUS STATISTICAL TESTS IN AGRICULTURAL EDUCATION RESEARCH, 1974-1982

Statistical Test or Technique Reported	Number of Studies Reported		
	Masters	Doctoral	Staff
Frequency Distribution	22	22	12
Range	1	4	3
Mean	43	47	12
Percentage	99	46	42
Standard Deviation	7	5	0
Coefficient of Correlation	8	16	7
Pearson r	5	25	3
Kendalls tau	0	2	1
Rank Order Correlation	9	8	3
Point Bisenal Correlation	0	1	0
Chi Square	19	44	8
Regression	2	8	3
Multiple Regression	4	10	1
t-Test	23	36	8
Analysis of Variance	31	68	16
Multiple Analysis of Variance	0	5	0
Factor Analysis	1	1	0
Discriminate Function Analysis	0	2	0

CONCLUSIONS AND RECOMMENDATIONS

All conclusions were based upon the results obtained in the study and can be held tenable only for the agricultural education research abstracts included in the Summaries of Research and Development Activities in Agricultural Education compiled and reported for the years 1974-1975 to 1981-1982. Following is a list of conclusions and recommendations based upon the findings of the study.

CONCLUSIONS

1. The number of studies reported almost tripled since the studies were compiled on a national basis starting in 1974. The number of studies reported increased from 54 to 168 from 1974-75 to 1975-76. This increase may have been because agricultural educators did not submit abstracts of research completed during the first year the studies were compiled on a national basis. The largest number of studies were reported during the 1979-1980 year with 181 studies being reported. Since that time, the numbers of studies reported seems to have plateaued.

2. Masters studies reported composed 48.5 percent of the research reported while doctoral and staff studies made up 29.7 and 21.7 percent of the research reported respectively. One undergraduate honors thesis was also reported.

3. The central region reported the largest percentage of studies completed, 43.2 percent, followed by the southern region 25.7 percent, the eastern region 19.0 percent and the western region 11.8 percent.

4. A total of 50 of the 96 institutions included in the study, or 52 percent, reported research completed in agricultural education. Three institutions, the Ohio State University, Oklahoma State University and The Pennsylvania State University were conducting over one-third of the research reported. Over two-thirds of the research reported is being conducted by eleven institutions.

5. Less than one percent of the research was reported as being funded research. The source of funding, if any, was not identified in the abstracts found in the Summaries.

6. Nine percent of the studies were classified as foreign studies by virtue of having data collected in countries other than the United States. Over 91 percent of the studies were classified as being domestic studies.

7. Descriptive studies comprised the majority of the research conducted in agricultural education as reported in the abstracts. Ninety percent of the studies reported were descriptive, 9.3 percent were experimental and .7 percent were historical.

8. Descriptive masters studies were the most prevelant type of studies conducted. A total of 44.5 percent of descriptive masters level studies were reported. Of the total studies reported, 4.1 percent were experimental doctoral studies.

9. Of the descriptive research reported, 45 percent were classified as survey studies, 13 percent were interrelationship studies, and 4.4 percent were developmental studies.

10. The school survey was the predominant type of survey reported with 26.3 percent of the researchers using it. Job analysis and documentary analysis were used 7.0 and 4.8 percent of the time respectively.

11. The causal comparative study was the predominate type of interrelationship study reported with 8.1 percent of the researchers reporting its use. Correlational techniques were used in 4.2 percent of the cases.

12. Developmental studies were reported infrequently in agricultural education research. Growth studies composed 3.5 percent of the studies reported while trend studies were conducted in one percent of the cases.

13. A total of 626, or 54.4 percent of the studies reported that questionnaires were used to collect data. Interviews were reported as being used in 14.3 percent of the cases, appraisal instruments in 18.6 percent of the studies and observation was used 3.7 percent of the time.

14. About one-third of the studies submitted for inclusion in the Summaries reported the statistical test or technique used. In two-thirds of the abstracts of the studies reported, it was impossible to determine the statistical test or technique used.

15. A higher percentage of doctoral studies reported the use of statistical tests or techniques than did masters or staff studies.

RECOMMENDATIONS

The researchers attempted to answer several questions by analyzing the abstracts of research submitted for inclusion in the Summaries. The following recommendations were made based upon the findings of the study and upon the knowledge gained while conducting the study. Therefore, the following recommendations must be evaluated accordingly. The recommendations are:

1. Agricultural educators should develop a standardized checklist for reference when writing abstracts of studies completed. Results of the study indicated that essentials such as type of research, specific procedures used and type of statistical test or technique used were often not reported.

2. Exemplary abstracts of research should be identified or developed to upgrade the quality of abstracts submitted to the compiler and editor of the Summaries.

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3. Researchers should include in the abstract whether or not the study was funded. It would be helpful if the extent of funding and the source of funding were reported. Results of the study indicated that information about funding was not readily available in the abstracts submitted.

4. Agricultural educators should continue to encourage foreign studies. As agricultural educators become more involved in global problems and concerns, results of foreign research will become more beneficial and useful than in the past. Also, further research is needed to determine the trend.

5. Agricultural educators should attempt to increase the proportion of historical and experimental studies conducted. The data collected in this study showed that there was a dearth of historical studies reported and less than 10 percent reported were experimental.

6. A larger number of institutions having teacher education programs in agriculture should conduct and report research findings in the Summaries. The data showed that 46 percent of such institutions had not reported any research during the eight year period studied.

7. Researchers in agricultural education should continue to study the research and development efforts of the profession. Analysis of the research reported in the Summaries, 1974-1982, revealed a dearth of research on agricultural education reearch. If research and development are to lead the way, we must continually review and evaluate our efforts.

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SUCCESS OF FORMER VOCATIONAL AGRICULTURE STUDENTS IN COLLEGE OF AGRICULTURE CURRICULA

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Since World War II, many professors and administrators in colleges of agriculture have questioned the wisdom of college-bound students taking vocational agriculture in high school. Although these reservations are seldom written, the advice to those students is "Get all the math and science you can in high school." Rarely, if ever, are students advised to "Get all the agriculture you can in high school." Thus, many high school students have elected to forego vocational agriculture in order to "better" prepare themselves for the rigors of college.

To assess validity of such advice, a number of studies were made in the 1950s and early 1960s to determine academic success of former vocational agriculture students in colleges of agriculture. Wiggins (1953), studying graduates from Pennsylvania State College over the period 1941 through 1952, concluded that "vocational agriculture . . . was equal to any other high school curriculum as preparation for an agricultural curriculum at the Pennsylvania State College." Cunningham (1958) studied agriculture student performance at Ohio State University. He found that students with vocational agriculture in high school had higher scholastic records in technical agriculture subjects and mathematics than did those without such training, but did not do as well in English. Horner, et al. (1960), reporting results of a study involving 421 agricultural students at the University of Nebraska, stated that "a good course in high school vocational agriculture is excellent college preparation for the student planning to attend agricultural college." Similar results were found in studies conducted in Kansas, Oregon, West Virginia, Iowa, and several other states. A summary of 27 of these studies was made by McClelland (1965) in which he concluded:

1. Former students of vocational agriculture do as well or better than those without vocational agriculture in agricultural colleges.

2. Students who had vocational agriculture were more successful in some beginning agricultural courses and in botany.

3. Vocational agriculture students who plan to attend college should also enroll in preparatory mathematics and science courses.

Considering the problem well-researched, few, if any, studies of this nature have been conducted since 1965. However, Barr (1982), reported that a number of deans from midwest and eastern colleges currently have the impression that vocational agriculture students do not get the mathematics, English and science backgrounds in high school necessary to compete in college. He noted that many prefer students with stronger science and mathematics backgrounds over those with vocational training and experience and question vocational agriculture programs as a source of quality students. Barr indicated that if this is

the prevailing philosophy, in the not-too-distant future those teaching agriculture in high schools and colleges, those involved in agricultural research, and those employed in government jobs in agriculture will have extremely limited agricultural backgrounds and, therefore, little or no feel for the farm. All of which prompted the question: Are the research findings from the 1950s and 1960s still valid? Certainly, changes in high school and college courses and curricula have occurred since the 1960s. Perhaps more important, major changes in student composition in vocational agriculture and in agricultural colleges have taken place since that time. Obviously, it's time to research the effect of vocational agriculture on performance of students in colleges of agriculture again. The research reported herein was conducted to begin that re-examination.

OBJECTIVES

Objectives of this study were to determine if former students of vocational agriculture do as well as others in agricultural curricula at West Virginia University with regard to:

1. Grade Point Average (GPA) upon graduation from college
2. Performance in basic common courses

METHODOLOGY

Data were collected from student files in the Student Records Offices, College of Agriculture and Forestry, West Virginia University, and at Potomac State College, a branch of WVU where a number of graduates begin their college careers. High school transcripts were scrutinized to determine vocational agriculture participation. Grades of basic college courses were recorded from college transcripts.

West Virginia University Computer Center facilities were used to sort data and determine mean values. Analysis of variance (F-Ratio) was utilized to measure significance of differences existing in course grades and overall grade point averages between student groups.

LIMITATIONS

The study was limited to the 154 students who:

1. Entered WVU or PSC as freshmen,
2. Graduated with Bachelors degrees in Animal and Veterinary Sciences, Plant and Soil Sciences, Resource Management, or Agricultural Education, and
3. Graduated during the 1982 and 1983 academic years.

FINDINGS

Mean course grades and overall grade point averages (GPAs) of students included in the study are found in the Table. Although the original intent was to categorize vocational agriculture experience by

"one or two years" and "three or four years," there were only six students who fell into the former category. Therefore, data were analyzed comparing the 23 students with one or more years of vocational agriculture with those 131 who had none.

A significant difference in grades was found only with respect to the course, English 2, a requirement for all students. Graduates who had not taken vocational agriculture in high school achieved higher grades in the course than those who had taken one or more years of vocational agriculture, grade averages of 2.86 and 2.48, respectively. Overall grade point averages at graduation were nearly identical for the two groups.

CONCLUSIONS

This study, although limited in scope, tends to reconfirm the conclusion reached by McClelland (1965) and others that former students of vocational agriculture do as well or better than those without vocational agriculture in agricultural colleges. Further studies are needed. For the moment, let's not write off vocational agriculture programs as a potential source of future agricultural educators, administrators and scientists.

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Table

Academic Performance in Basic Courses in Agricultural Curricula by Students Who Did and Did Not Have Vocational Agriculture in High School

	Vo-Ag in High School		Overall Mean	
	One or more years (n=23)	None (n=131)	(N=154)	F Value
Biology 1 General Biology	2.48	2.41	2.42	0.12
Biology 2 General Biology	2.16	2.48	2.43	1.98
Chemistry 11 Survey of Chemistry	2.77	2.45	2.58	0.99
Chemistry 12 Survey of Chemistry	2.27	2.43	2.33	0.08
Chemistry 15 Fundamentals of Chemistry	2.40	2.41	2.40	0.00
Chemistry 16 Fundamentals of Chemistry	2.11	2.35	2.33	0.62
Math 3 College Algebra	2.26	2.55	2.50	1.31
English 1 Composition and Rhetoric	2.57	2.77	2.74	1.18
English 2 Composition and Rhetoric	2.48	2.86	2.80	3.99*
Economics 51 The Economic System	2.56	3.10	2.93	2.48
Economics 54 Principles of Economics	2.71	2.77	2.77	0.05
Agronomy 2 Principles of Soil Science	2.65	2.47	2.50	0.68
Agromomy 10 Forest Soils	2.00	.92	1.93	0.01
Ag. Economics 104 Farm Management	2.62	2.72	2.70	0.22
Ag. Mechanics 152 Shop Theory and Methods	3.52	3.44	3.48	0.16
Animal & Vet. Science 51 Principles of Animal Science	2.91	2.88	2.89	0.02
Plant Science 52 Principles of Plant Science	2.72	3.04	2.98	1.98
OVERALL GPA	2.81	2.88	2.87	0.50

Grade Scale

4 A
3 B
2 C
1 D
0 F

*ANOVA significant at .05 level of confidence.

INSTRUCTIONAL STATUS OF AGRICULTURAL MECHANICS COMPETENCIES NEEDED AND POSSESSED BY TEACHERS OF VOCATIONAL HORTICULTURE IN PENNSYLVANIA

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NEED FOR THE STUDY

The horticulture industry has grown increasingly important in the overall picture of agriculture in the United States. Consequently, the need for instruction in horticulture has become an increasingly important aspect of agricultural education. Today, there are nearly 100 vocational agriculture departments offering total or partial horticulture programs in Pennsylvania. Nursery management, landscape design, fruit and vegetable production, greenhouse technology, and retail floriculture are all specialty areas of horticulture being taught throughout the state. Due to geographical location or poor graduate placement, few programs encompass all these aspects of horticulture in their course of study. There is, however, a highly neglected area of horticulture that is beginning to be considered a missing link in many of these programs. This missing link is agricultural mechanics and their application to the horticulture industry.

Although agricultural mechanics have always been an integral component of past and present agricultural teachings and practices, they have taken on an even greater importance at all levels of agricultural education. Educators no longer view agricultural mechanics skills as so called "shop skills" of the past but as "life skills" of the future. Horticulture teachers must also include and expand the agricultural mechanics phase of instruction into the program. Teachers of horticulture must possess or develop proficiency in the agricultural mechanics competencies in order to better prepare students for job opportunities.

Since the early 1970s, numerous individuals have investigated what should be taught in the area of horticulture mechanics. The majority of these identified skills involving the understanding, use, and operation of horticulture equipment. Competencies in this area should be developed. However, there is a need to further identify the agricultural mechanics competencies that are needed and possessed by vocational horticulture teachers.

OBJECTIVES OF THE STUDY

A descriptive research survey was conducted to determine what agricultural mechanics competencies were being taught by vocational horticulture teachers in Pennsylvania, and to compare the degree of proficiency possessed by teachers for particular competencies with the indicated importance of these same mechanics competencies by the horticulture industry. The study was also designed to determine the influence of sex, years of teaching experience, and place of employment on the agricultural mechanics proficiency possessed by vocational horticulture teachers. The following objectives were identified:

1. To determine what agricultural mechanics competencies were being taught by vocational horticulture teachers in Pennsylvania.

2. To determine if the agricultural mechanics competencies being taught by vocational horticulture teachers were those considered important by the horticulture industry.

3. To determine the vocational horticulture teachers' level of proficiency in agricultural mechanics considered important by the horticulture industry.

4. To determine the influence of sex, teaching experience, and place of employment on vocational horticulture teachers' level of proficiency in agricultural mechanics.

5. To identify a core of agricultural mechanics competencies for all specialty areas of vocational horticulture.

METHODS AND PROCEDURES

Several prior works were reviewed in arriving at the final list of 171 competencies. These included studies by Hoerner (1968), Grant (1971), Berkey and Drake (1972), Shipley (1974), Zubrick (1974), and Buriak (1980). V-TECS (1976) catalogs were also used in the compilation of the list.

The Grant study was the basis for the agricultural mechanics headings used to group individual competencies. Mechanics groupings included:

Fitting and Repairing Digging, Tree, and Grass-Cutting Tools
Plumbing and Water Systems
Horticulture Construction
Agricultural Tractors and Nursery-Related Equipment
Basic Horticulture Mechanics
Electricity and Electric Motors
Environmental Control
Arc and Gas Welding
Spraying and Spreading Equipment
Soils, Irrigation, and Sprinkling Systems

Subject Selection

The accessible population of teachers for the study were those teaching at least a partial horticulture curriculum (n=104) as listed in the Pennsylvania Vocational Agriculture Teachers Directory. The accepting sample was 85 which gave a data sample of 64. Eleven persons thought to be horticulture teachers indicated they were no longer teaching horticulture; seven surveys were not useable and four were received after the keypunch deadline. Horticulture businesses were included in the study by means of simple random selection from Who's Who in Horticulture in Pennsylvania. The use of the Pennsylvania Vocational Agriculture Teachers Directory and Who's Who in Horticulture in Pennsylvania was intended to minimize frame error.

Prior to the mailing, the lists of teachers and businesses were closely examined by the researcher for duplication. The researcher concluded that no teacher or business had a greater or lesser chance of being selected, lessening the chance of selection error.

Table 1. Scope of the Study

Group Surveyed	Surveyed		Accepting Sample		Data Sample	
	n	%	n	%	n	%
Teachers	104	77	85	82	64	62
Industry	31	23	17	55	16	52
Totals	135		102		80	

Instrumentation

A survey instrument was developed that consisted of two parts. These were a checklist of 171 agricultural mechanics competencies in ten groupings and a questionnaire of demographic information for both teachers and the business respondents. Teachers were asked to indicate if each competency was or was not being taught. Teachers were also asked to check their degree of proficiency as either extensive, adequate, or not proficient. Business respondents were asked to mark the importance of each competence to their enterprise as either essential, somewhat important, or not important.

The demographic information requested of teachers consisted of percentage of the program that was horticulture, which of seven areas within horticulture were being taught, the percentage of time allotted to agricultural mechanics instruction, age and sex of the respondent, the place of employment, years of teaching experience, and college credits in agricultural mechanics. Business respondents were asked the type of horticulture business in which they were involved and the number of persons employed in that business in the peak season.

Face validity of the instrument was determined by input from faculty in the Horticulture Department at the Pennsylvania State University, horticulture teachers in the field, and the author's experience and background. Measurement error posed a threat to the study since no procedures to assure other than face validity were initiated. Reliability measures were not determined for the instrument.

The survey instrument was mailed on April 2, 1981. The follow-up procedure was: April 20, 1981, the first follow-up letter was sent to all non-respondents. Individuals who had not completed a survey form as of May 5 received a second follow-up letter. On May 11, 1981, all non-respondents were contacted by phone.

Data Analysis

Frequencies and percentages were calculated to report current levels of instruction in agricultural mechanics. Teacher and business responses were coded on a 1-3 scale and means for each of the 171 agricultural mechanics competencies were calculated for both teacher proficiency and horticulture business importance. Competencies were equally weighted.

The independent t test was used to analyze mean differences between teacher proficiency and business importance, male and female proficiency levels, and beginning and experienced teacher proficiency levels. One-way analysis of variance was used to analyze mean differences regarding place of employment on proficiency levels. The 0.05 level of significance was the critical standard in all analyses.

RESULTS

Two agricultural mechanics competencies were being taught by 90 percent or more of the responding teachers. Findings also showed that 70 percent or more of the responding teachers were teaching 21 of the competencies, while 53 of the 171 competencies were being taught by 50 percent or more of the teachers. Table 2 presents a listing of the ten most often taught agricultural mechanics competencies.

Table 2. Ten Agricultural Mechanics Competencies Most Often Taught

Agricultural Mechanics Competency	Percentage Teaching
o Maintain a clean and orderly work area	94%
o Identify, select, and use hand tools	92%
o Select and use proper protective clothing and equipment	89%
o Interpret chemical labels	88%
o Properly mix pesticides	86%
o Clean and store dry and liquid application equipment	84%
o Clean tools of dirt, grease, and rust	81%
o Operate liquid spraying equipment	78%
o Operate a dry fertilizer or chemical spreader	77%
o Make free-hand sketches	75%

Teaching percentages were also calculated on a mechanics grouping basis. Table 3 presents a rank order listing of agricultural mechanics groupings based on the frequency of tasks being taught within each grouping.

Table 3. Rank Order of Agricultural Mechanics Groupings Based on Frequency of Tasks Being Taught Within Each Grouping.

Agricultural Mechanics Groupings	Number of Competencies per Grouping
o Spraying and spreading equipment	9
o Fitting and repairing digging, tree, and grass-cutting tools	11
o Basic horticulture mechanics	22
o Agricultural tractors and nursery-related equipment	28
o Horticulture construction	32
o Arc and gas welding	12
o Plumbing and water systems	16
o Electricity and electric motors	20
o Soils, irrigation, sprinkling equipment	10
o Environmental control	11

Mechanics Competencies Being Taught in Relation to Business Importance

Agricultural mechanics competencies were grouped as "most essential" (mean 2.75 or higher), "essential" (mean 2.74-2.25), "somewhat essential" (mean 2.24-1.75), and "not essential" (mean less than 1.75). The range of each grouping was arbitrarily chosen by the researcher. The number of competencies in these groupings were 15, 55, 87, and 14 respectively.

Responding horticulture businesses placed most emphasis on the agricultural mechanics groupings of agricultural tractors and nursery-related equipment and spraying and spreading equipment. Of the 15 mechanics competencies with a mean of 2.75 or higher, 13 were from these two groupings.

Ten of the 15 "most essential" competencies were being taught by 70 percent or more of the responding teachers. For the "essential" agricultural mechanics competencies, ten of the 55 were being taught by 70 percent or more of the responding teachers. Fifty percent or more of the responding teachers were teaching 42 of the 70 mechanics competencies categorized as "most essential" and "essential" (mean 2.25 or higher). These data are presented in Appendices A and B.

Teacher Proficiency in Relation to Business Importance

Teacher and business responses showed that there were a total of 45 (25%) agricultural mechanics competencies significantly different at the .05 level between teacher proficiency and business importance. In 41 (91%) of these instances, business means for importance exceeded teacher means for proficiency. There were a significant differences between proficiency and importance for 14 of the 15 mechanics competencies with a mean higher than 2.75. In each of these cases, business means for importance exceeded teacher means for proficiency.

Eighteen agricultural mechanics competencies categorized as "essential" were significantly different between teacher proficiency and business importance. Business importance means exceeded teacher proficiency means in each of the 18 competencies. The above findings were subject to comparison-wise error rate. Multiple t tests resulted in differences due to chance alone.

Teacher Proficiency in Relation to Sex, Years of Teaching Experience, and Place of Employment

Significant differences were found between responding male (n=54) and female (n=9) teachers at the .05 level in 105 (61%) of the 171 competencies. In each of the 105 instances the proficiency means for the male vocational horticulture teachers exceeded that of the female vocational horticulture teachers.

Beginning teachers were those teachers with three or less years of teaching experience while experienced teachers had four or more years of teaching experience. The number of years of teaching experience in relation to teacher proficiency showed significant differences between

responding beginning teachers (n=19) and experienced teachers (n=45) in 14 (8%) of 171 mechanics competencies. The agricultural mechanics grouping with the highest number of significantly different competencies for these two groups was agricultural tractors and nursery-related equipment. Five (18%) of the 28 competencies in this grouping were significantly different. The above findings were again subject to comparison-wise error rate.

An analysis of the responding teachers place of employment showed significantly different proficiency levels for 28 (16%) of the 171 mechanics competencies.

Conclusions

Data indicated that the agricultural mechanics competencies in this study were being taught on a limited basis. At the arbitrarily chosen teaching level of 70 percent, it was found that only 21 mechanics competencies were being taught. Further breakdowns indicated that only 53 competencies were being taught by 50 percent or more of the teachers. Of the ten agricultural mechanics groupings surveyed, spraying and spreading equipment was ranked highest on the basis of the frequency of competencies being taught within each grouping.

After calculating the importance means of each agricultural mechanics competency, conclusions could be drawn between what competencies are being taught in relation to their importance. Vocational horticulture teachers were generally teaching the important agricultural mechanics competencies. Of the 15 agricultural mechanics competencies rated as "most essential", ten were being taught by 70 percent or more of the teachers. The findings also indicated that 42 of 70 mechanics competencies categorized as "most essential" and "essential" were being taught by 50 percent or more of the teachers. Further analysis of the data showed that a decrease in competency importance was accompanied by a corresponding decrease in instruction. Although the first portion of this study indicated the overall instruction rate in agricultural mechanics was somewhat low, horticulture teachers have compensated for this by teaching those mechanics competencies important to the horticulture industry.

Importance means were also used as a basis for identifying a core of agricultural mechanics competencies for an overall horticulture program. There should be a concentration of instruction from the three areas of agricultural tractors and nursery related equipment, spraying and spreading equipment, and plumbing and water systems. Additional units of the core of instruction would be the areas of basic electricity and woodworking. The only mechanics grouping that would absolutely not be recommended would be arc and gas welding. Due to the low "n" for responding specialty areas from the horticulture industry, conclusions regarding cores of agricultural mechanics for specialty areas of horticulture cannot be made.

Conclusions regarding the findings involving the proficiency that responding teachers possess for agricultural mechanics and the

importance that responding businesses reported for the competencies will not be drawn due to a comparison-wise error rate.

Recommendations

- Workshops should be conducted to impress upon vocational horticulture teachers the role, importance, and implication of agricultural mechanics for vocational horticulture.
- In-service agricultural mechanics courses in the areas of agricultural tractors and nursery-related equipment and spraying and spreading equipment. These courses should be designed specifically for vocational horticulture teachers.
- Agricultural education majors who are specializing in horticulture should be taught an agricultural mechanics course that is horticulture oriented.

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Appendix A

Most Essential Agricultural Mechanics Competencies

Agricultural Mechanics Competency	Importance to Industry	Percentage Teaching
Agricultural Tractors & Nursery-Related Equipment		
o Safely operate a tractor	2.88	73%
o Lubricate & service a gas or diesel tractor	2.88	61%
o Read and follow service manuals	2.88	61%
o Safely operate a truck	2.88	20%
o Winterize the tractor engine	2.81	53%
o Test antifreeze	2.75	48%
Basic Horticulture Mechanics		
o Maintain a clean and orderly work area	2.94	94%
o Sharpen a knife	2.75	73%
Spraying and Spreading Equipment		
o Operate a dry fertilizer or chemical spreader	2.88	77%
o Interpret chemical labels	2.88	88%
o Select and use protective clothing and equipment	2.88	89%
o Properly mix pesticides	2.81	86%
o Calibrate spray and spreader equipment	2.81	73%
o Clean and store chemical application equipment	2.81	84%
o Operate liquid spraying equipment	2.75	78%

Appendix B

Essential Agricultural Mechanics Competencies

Agricultural Mechanics Competency	Importance to Industry	Percentage Teaching
Fitting and Repairing Digging, Tree, and Grass-Cutting Tools		
o Replace handles into hand tools	2.27	59%
Plumbing and Water Systems		
o Repair a leaking garden hose	2.60	67%
o Use, maintain, and install fertilizer dilution devices	2.53	52%
o Identify and use plumbing tools and supplies	2.52	33%
o Install and maintain automatic timers and mist systems	2.40	45%
o Install a solenoid valve	2.40	26%
o Measure and cut metal and plastic pipe	2.40	41%
o Select pipe and fittings	2.33	33%
o Repair leaky faucets and valves	2.33	34%
o Ream and thread pipe	2.27	30%
o Assemble pipe and fittings	2.27	31%
Horticulture Construction		
o Interpret blueprints or sketches	2.47	56%
o Drive and remove nails	2.44	73%
o Drill holes	2.44	72%
o Make free-hand sketches	2.33	75%
o Replace plastic covering on greenhouses	2.31	34%
o Build, prepare, and remove forms	2.27	36%
o Repair greenhouse benches	2.27	66%
o Identify and use nails, screws and fasteners	2.25	67%
o Select and use paint and paint brushes	2.25	70%
Agricultural Tractors and Nursery-Related Equipment		
o Make minor repairs on tractors	2.69	69%
o Use a battery charger	2.69	56%
o Operate, adjust, and maintain a mower	2.69	72%
o Lubricate and maintain a small gas engine	2.69	70%
o Clean, gap, and replace spark plugs	2.69	70%
o Lubricate and service a truck	2.69	19%
o Safely operate and maintain a chain saw	2.63	55%
o Adjust carburetor mixture and speed screw	2.63	66%
o Clean and install breaker points	2.63	58%
o Operate, adjust, and maintain rototillers	2.63	68%
o Operate, adjust, and maintain a soil shredder	2.50	61%

Appendix B

Essential Agricultural Mechanics Competencies

Agricultural Mechanics Competency	Importance to Industry	Percentage Teaching
o Identify small gas engine components and their functions	2.44	64%
o Operate, adjust, and maintain cultivators	2.38	31%
o Use and maintain hydraulic regulators, lines, and cylinders	2.38	25%
o Maintain and safely operate a forklift	2.38	8%
o Operate, adjust, and maintain planters	2.31	28%
o Tune-up a tractor engine	2.31	39%
Basic Horticulture Mechanics		
o Identify, select, and use hand tools	2.69	92%
o Use fire fighting equipment	2.69	59%
o Clean tools of dirt, grease, and rust	2.63	81%
o Plan and arrange a tool storage	2.50	75%
o Sharpen scissors	2.44	35%
o Tie common knots	2.38	33%
Electricity and Electric Motors		
o Replace fuses	2.56	44%
o Reset circuit breakers	2.56	48%
o Repair electrical cords	2.38	47%
o Identify and safely use electrical tools and supplies	2.33	49%
o Wire on-off switches	2.25	36%
Environmental Control		
o Maintain ventilation systems	2.50	53%
o Adjust a time clock from long day to short day cycles	2.44	55%
o Correctly postition controls and sensors	2.38	48%
Spraying and Spreading Equipment		
o Qualify for a commerical pesticide applicators license	2.56	64%
o Operate dusting equipment	2.44	48%
Soils, Irrigation, and Sprinkling Systems		
o Measure with wheels, tapes, and chains	2.38	63%
o Operate a sprinkler irrigation system	2.25	20%

Identification and Development of Guidelines, Strategies and Materials to Improve Supervised Occupational Experience Programs in the Northeast

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INTRODUCTION/NEED FOR THE STUDY

The scope and quality of supervised occupational experience programs (SOEP) in vocational agriculture is a matter of national concern in the agricultural education profession. The National Advisory Committee on Agricultural Education listed the quality of agricultural SOEP as a priority area for improvement. Miller (1983) and Williams (1983) found SOEP to be a primary component of vocational agriculture in need of improvement. National level concern regarding SOEP was also demonstrated by the 1982 national conference on SOEP held in Virginia and coordinated by the National FFA Association. A second national conference also coordinated by the National FFA is scheduled for July of 1984.

The status of agricultural SOEP in the Northeast regional states reflects the national trend of declining scope, quality and percent of student participation. For example, in New York State a survey by Berkey and Sutphin (1983) showed only 28 percent of vocational agriculture students with SOEP of more than 300 hours, and 61 percent of students without any SOEP as part of their vocational agriculture experience. The survey also identified a lack of teacher time for SOEP supervision during both the school year and summer, and limited travel reimbursement to be a barrier to conducting SOEP for approximately 60 percent of agriculture teachers. Similar trends and barriers were judged to exist in other states in the Northeast.

Agricultural educators in the Northeast Region began addressing the need to strengthen SOEP in vocational agriculture at the 1981 Eastern Regional Joint (NVATA, NASAE, and AATEA) conference held at the University of New Hampshire. Position papers, a symposium and small group discussions were used to address the theme of "SOEP in Agricultural Education for the Future." This conference was followed by the 1982 Eastern Regional Joint Conference at the University of Delaware which had as its theme, "Implementing Supervised Occupational Experience Programs in Agricultural Education." At the 1982 joint conference, a strong need was expressed to further address improvement of SOEP in vocational agriculture by a Northeast regional research project. Hatch research monies to fund a regional project were found to be available through the Agricultural Experiment Station allocation to the Department of Education at Cornell Unviersity. A proposal subsequently submitted was approved and a research team located in the agricultural education program at Cornell initiated work on the three year regional project. The results of the Northeast regional project to improve SOEP are reported in this paper.

PURPOSE AND OBJECTIVES OF THE STUDY

The purpose of the study was to develop and field test curriculum materials from research based information that could be used to improve the quality of agricultural supervised occupational experience programs (SOEPs) in the Northeastern United States and New York State in particular.

The specific project objectives were to:

1. Develop guidelines, implementation strategies and resource materials for use by students and their teachers in planning and conducting supervised occupational experience programs (SOEP) in agriculture.

2. Field test and revise supervised occupational experience program guidelines, implementation strategies and resource materials.

3. Describe the status of exemplary supervised occupational experience programs in schools located in each of ten states in the Northeastern United States (a) prior to and (b) after field testing the project guidelines, implementation strategies and resource material.

PROCEDURES

The procedures for this investigation involved a three phase plan. Each phase was conducted over a one year period beginning in the Fall of 1981. Funding for the project was secured through a Cornell University Agricultural Experiment Station Hatch Grant.

In Phase I, guidelines, implementation strategies and resource materials for use in planning and conducting occupational experience programs were identified/formulated via (a) observation of exemplary and innovative programs in 12 Northeastern States, (b) a review of related literature, and (c) a review by selected teachers, teacher educators and state supervisors of agriculture in the Northeast.

Secondary school agriculture programs with exemplary and innovative SOEP were nominated independently by head state supervisors and teacher educators in each of the 12 states. After initial contact with the agriculture teachers and their

administrators, direct on-site observations and interviews were made by one of two members of the research team using an interview schedule. Observers were free to ask additional questions beyond those on the interview schedule in order to obtain as much information as possible. Vocational agriculture teachers were promised anonymity for their response. Responses were recorded on the interview form and resource materials were collected as provided by the teachers.

Information from the site visits was combined with material synthesized simultaneously with the site visits. Thus, a draft version of guidelines, implementation strategies and resource materials was formulated.

The draft version was mailed to presidents of state vocational agriculture organizations, head teacher educators and head state supervisors one month prior to the May 1982 Eastern Regional Joint Agricultural Education Conference. At the Conference, copies of the materials were distributed to all other teachers, teacher educators and state supervisors in attendance. Conference participants were sub-divided into three groups for a two hour review and critique work session led by research project staff. Recorders were appointed to document recommendations. Suggestions were pooled from each of the three groups by project staff for revision of the SOEP materials.

A set of trial guidelines, implementation strategies and resource materials for occupational experience programs applicable to vocational agriculture in the Northeast region was thus developed. Since many resources were available which could not be included in the SOEP packet due to the bulk of material and overlapping content, an additional section was proposed to list the sources of these materials. This section was titled "Additional Resource Materials".

Phase II consisted of field testing, evaluating and revising the guidelines, implementation strategies, resource materials and additional resource material (trial packet) developed in Phase I. One school in each of 10 states was designated by the respective head state supervisors and teacher educators as a try-out/pilot center. During a one year try-out period, the degree of involvement in supervised occupational experience programs by students and teachers was evaluated by a written and on-site preassessment and post assessment by research project staff. The assessment was accomplished by attaching an evaluation section to each item in the packet. Responses called for assessing conditions prior to, and after, the try-out period with respect to each items. Teachers in the try-out centers were also asked to make open-ended comments and recommendations throughout the document. Information on background characteristics related to supervised occupational experience

programs in the ten exemplary try-out centers was also collected. Anonymity was promised to the respondents.

As part of Phase II, the trial packet was mailed to head agriculture teacher educators and state supervisors in 10 Northeastern States and was distributed to nine teachers of agriculture enrolled in a masters program at Cornell University. The teacher educators and state supervisors were invited to provide input by mail and/or attend a special work session conducted by the research staff during the 1982 AVA Convention held in St. Louis, Missouri.

In Phase III, data from Phase II were collected and analyzed resulting in (1) a final revision of the Guidelines, Implementation Strategies, Resource Materials and Additional Resource Materials, (2) a description of the change in program characteristics associated with the one year try-out in 10 exemplary programs, (3) a description of exemplary programs in 10 Northeastern States and (4) a slide/tape set of ideas from 10 exemplary schools in the Northeast. Copies of the Guidelines, Implementation Strategies, Resource Material and Additional Resource Material will be distributed to teachers in schools who participated during Phase I and II and to head agriculture teacher educators and state supervisors. Specific use of the materials will be determined by appropriate individuals within the respective states.

The project has been extended for one year, 1984 through September 1, 1985 for implementation of the materials in New York State. Teacher preservice and inservice programs targeted for teachers and administrators are part of the implementation strategy planned for New York State. The SOEP guidelines, implementation strategies and resource materials will be revised if needed to reflect the Phase II implementation in the state.

FINDINGS

Development of Guidelines, Implementation Strategies and Resource Materials

Guidelines for supervised occupational experience programs were developed with regard to: (a) definition, (b) the purpose, (c) types of SOEP, (d) appropriate clientele, (e) school administrative support and policy, (f) supervision/coordination/placement, (g) relationship to in-class instruction, (g) relationship to FFA, (h) legal requirements, (i) evaluation, and (j) teacher preparation for SOEP. Strategies for implementing the guidelines were formulated for each of the nine areas. Resource materials such as brochures,

transparency masters and evaluation forms were identified from existing sources developed to assist teachers in the implementation phase. Hence, the total document of approximately 250 pages included three major foci; SOEP guidelines, implementation strategies and resource materials.

A glossary of terms and a list of sources for additional resource materials were included in the document as supplementary information. Standards from the National Criteria for Quality Vocational Programs in Agricultural Education are included for consideration.

One Year Validation of SOEP Packet by Try-Out/Pilot Center

The trial guidelines, implementation strategies and resource materials were distributed to 10 exemplary pilot centers in each of 10 states in the Northeast Region during August 1982 on-site visits by research project staff. Pilot data were collected during on-site visits in August of 1983.

The SOEP packet was accepted and highly rated by all 10 try-out centers. An average of approximately 90 percent of all the guidelines and implementation strategies were utilized at the centers. The extent of utilization for each item varied by center due to differences in the characteristics of the programs.

All centers recommended that each of the guidelines and implementation strategies be retained. An item by item review during the August 1983 end of try-out period conference resulted in refinement of a small number of existing items and the addition of a few items.

Most (90 percent) of the resource materials were recommended for acceptance in their present form. In a few cases, new materials were suggested based on experience in using the materials at the centers over a long period of time.

Slides were taken of SOEP activities with the try-out of the Guidelines, Implementation Strategies and Resource Materials. The slides were collated into a slide set and tape to highlight and illustrate activities described in written form in the SOEP packet.

Status of Exemplary Supervised Occupational Experience Programs in Ten Northeastern States

A description of exemplary school pilot sites was determined for the 1982-83 school year by response to a questionnaire. Data were collected for the two categories of general school information and vocational agriculture programs in March 1983.

School student population ranged from 147 to 1800 for the 10 schools. Vocational agriculture was taught in grades 9 through 12 in all 10 schools and in grades 7 and 8 in one school. Five of the 10 schools had an adult agriculture program.

Twenty-three agricultural instructors were associated with the 10 programs for a mean of 2.3 teachers per school. The mean number of total years teaching and years teaching at the present site for each teacher was 9.3 and 8, respectively. Sixty-one percent of the instructors completed a college course which included instruction on SOEP; 22 percent completed a college course exclusively devoted to SOEP; 13 percent had at least two courses on SOEP; while four percent had no college instruction regarding SOEP.

The number of vocational agriculture students ranged from 17 to 296 with a mean of 128. Two of the 10 schools had 100 percent of their students conducting SOEP. The average percent of agriculture students with SOEP was 92 percent among seven of 10 high schools who reported complete data for students in grades 9 through 12.

Specialization areas taught in the 10 schools included 10 with production agriculture; four agricultural mechanics; seven horticulture; two natural resources; three agricultural business; three agricultural exploratory and one horse science. All programs taught more than one agriculture specialization.

Departments which had laboratory and related facilities included 100 percent shop; 90 percent land laboratory facilities; 70 percent greenhouse, 40 percent forestry plot, 30 percent nursery, 40 percent large animal lab and 10 percent small animal lab. Nine of 10 programs utilize school facilities for at least some aspect of their student's SOEP. On the average, teachers reported that approximately 36 percent of their students used the school based SOEP opportunity. In comparison with other types of SOEP, teachers reported an average use of 36 percent farm placement; 29 percent family farm; 22 percent placement in a non-farm agriculture experience; and six percent in the family non-farm agriculture business. The researchers caution about drawing conclusions about the average percent of use by type because of the wide range between the states. For example, use of the family farm for SOEP ranged from two percent to 70 percent with a mean percent of 29.

The highest percent (41%) of vocational agriculture students lived in a rural area but not on a farm, while 30 percent lived in a suburban or village area. Twenty-six percent lived on a farm and two percent lived in a city or urban area.

Eight of 10 schools had 100 percent FFA membership. Two schools had 95 and 21 percent of their vocational agriculture students in FFA.

Effect of Using the SOEP Packet on the SOEP of Try-Out/Pilot Centers

A pretest-posttest technique was used to determine changes in SOEP at the try-out centers field testing the trial SOEP materials. The test consisted of the status of each SOEP guideline and implementation strategy in terms of established units, e.g. number of visits or hours for a guideline, and a yes-no response to use of an implementation strategy. The pretest data was as of the end of the 1982 school year (August) and the posttest vintage was August 1983 when end of field test site visits were conducted by the researchers.

The reader is cautioned at this point that the research procedures used for the field test were not such to allow the interpretation that changes in SOEP at try-out centers were necessarily the direct result of field testing the project SOEP materials. For example, involvement of try-out center administrators may have increased their awareness and subsequent expectations for SOEP. Or, agriculture teachers at the try-out centers may have made an extra effort on SOEP in order to have their center look good at the end of the field test. Thus, any interpretation of the changes found must be interpreted in the context of direct causality not being established.

On the other hand, several conditions did exist that would lend support to inferring a causal relationship between field testing the project materials and the SOEP changes that occurred at the try-out centers. First, to the knowledge of the researchers, no additional teacher time, material or other support were added at the try-out centers for the field test. Further, the end of the field test site interviews revealed very strong acceptance by teachers of the trial SOEP materials. In addition, teachers indicated that the trial materials contained a number of new guidelines and strategies which they used successfully during the field test period.

The researchers also wish to point out that no claim is made that the trial SOEP materials will result in comparable changes in most vocational agriculture programs in the Northeast region. The try-out centers were purposefully selected based on the existence of a high qulaity SOEP program. Such selection means the existence of teacher expertise and a positive atitude toward SOEP, and administrator support in terms of providing the necessary resources (e.g., in-school time for visits, summer employment, and tranportation). Lack of one or more of such conditions may pose a sufficient barrier so as to negate the effect by the project materials. The exemplary programs were selected to avoid barriers that could compromise the validity of the field test.

A final disclaimer on the changes after use of the project materials is that the number of field test centers (i.e. one in each of 10 states) as well as the variation in units used does not permit application of statistical tests to determine relationships between individual guidelines. Thus the data presented will be descriptive rather than inferential.

Major Changes for Guidelines

1. The average number of hours acceptable as a minimum for an SOEP increased from 266 to 477 which reflected input from seven of the ten try-out schools. The other three schools had no minimums.

2. The percentage of enrolled agriculture students using school based SOEP increased 14 percent. The percent of enrolled students placed with an employer dropped eight percent, working in the family business increased four percent, and the percentage of enrolled students who were self employed for SOEP increased two percent.

3. In placement of students for SOEP, the number of try-out centers that involved guidance staff in placement increased from five to eight.

4. Use of direct employer contact for identification of SOEP work stations increased from five to nine centers.

5. The number of hours spent providing in-class instruction for the various areas of SOEP (e.g. record keeping) showed a reduction of one to two hours. However, the data from the end of field test site interviews indicated that no change in time spend on in-class instruction had taken place. Rather, that more accurate time records were kept during the field test period.

6. Other guidelines generally showed an increase in use by one to two centers following the guidelines.

Changes for Implementation Strategies (Including Resource Materials)

Almost all implementation strategies showed an increase in the number of try-out centers using the strategies. The range of increase in number of centers was one to five with an increase of two centers being the mode.

CONCLUSIONS

Conclusions for the study are interpreted from data on 10 selected exemplary programs. Hence, the reader is cautioned about making inferences beyond the population.

1. SOEP can be successfully implemented in schools and vocational agriculture programs with small and large enrollments.

2. In general, schools with exemplary SOEP have two or more teachers, three or more specializations, program offerings in grades nine through 12, near 100 percent FFA membership among vo-ag students, have a school shop and land laboratory and frequently have either a greenhouse, forestry plot, nursery or large animal laboratories.

3. Generally, teachers in schols with exemplary SOEP have taught nine years or more almost all of which is at the same school and have knowledge of SOEP at least part of which was learned through college instruction.

4. Generally, students in schools with exemplary SOEP are about equally distributed among urban, farm and rural nonfarm dwelling, accept SOEP as part of their total vocational agriculture experience, and select from a range of SOEP's.

5. Schools with exemplary SOEP have a high percent of their students with SOEP distributed among the specialization areas including farm production, horticulture, agribusiness, agricultural mechanics, and horse science.

6. High quality SOEP exists in a variety of forms and in very different school situations so long as teachers have enthusiasm and interest in the program and certain other key elements are in place such as: administrative morale and credit toward graduation, mileage reimbursement or school vehicle for supervision, and extended employment for SOEP summer supervision.

7. The packet of SOEP materials as revised based on the field test is useful for conducting quality SOEP for vocational agriculture students.

8. Teacher expertise and positive attitude, and administration expectation and support, are necessary in order to conduct quality SOEP.

9. Providing a variety of options for implementation strategies tends to strengthen SOEP programs.

10. Establishing guidelines for SOEP tends to increase the number of hours (scope) for student SOEP.

RECOMMENDATIONS

1. Teachers in all agricultural specializations should use exemplary programs as models in improving their SOEP.

2. Teachers with exemplary SOEP should be given the opportunity and encouragement to share their ideas with other teachers preferably at the exemplary school site.

3. State supervisors, teacher educators and local administrators should conduct on-sited visitations to local programs on a regular scheduled basis to provide encouragement, support and guidance on SOEP.

4. Research is needed to identify factors associated with high quality SOEP.

5. Additional research is needed to determine the significant barriers to implementing quality SOEP.

6. Agricultural education staff in individual states should examine the revised SOEP packet developed and tested in this project to determine the applicability and use in their respective states.

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